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MOTOR AGE

Olympia Shows Latest Ideas of Motor Design

LONDON, Nov. 21—The Olympia show continues in full swing, the daily attendance surpassing the expectation of many exhibitors, in spite of the numerous attractions, among which must be noted the spirit of parliamentary controversy over the budget at the present time. The attendance of Europeans is a noteworthy feature and it doubtless largely accounts for the large number of French, German, Italian, Swiss and Belgian cars which are on exhibition, as well as owing to the fact that there is no Paris salon this year.

Chief interest is centered in the sliding-valve type of motor which was introduced a year ago by the Daimler company, who adopted the Silent Knight type. This step prompted many other manufacturers to enter the experimental field, with the result that today half a dozen concerns have motors of this type, many of which have been tried out for a period of 8 to 10 months with the utmost satisfaction.

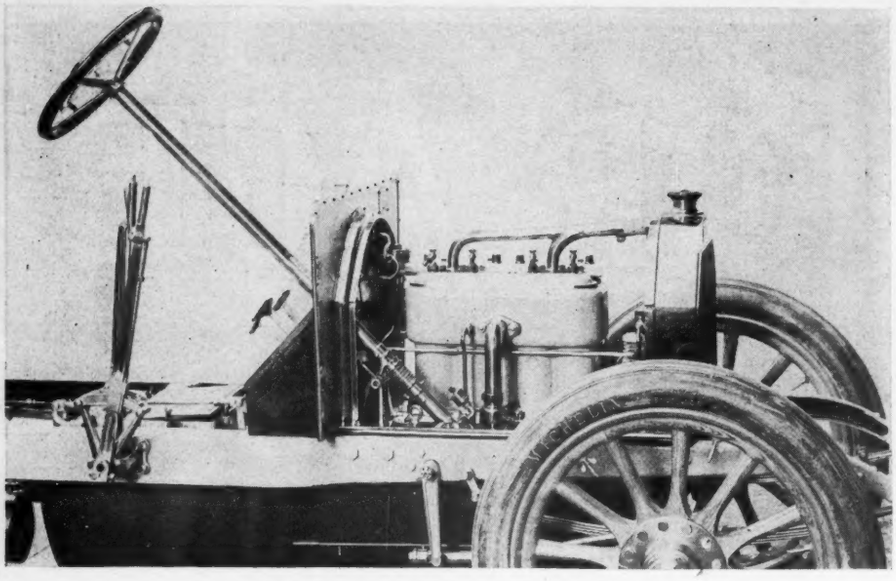
Next of importance is the great trend towards the torpedo-type of body as it has been designated. This body undoubtedly offers many advantages and gives promise of great popularity in the future. It is the direct outcome of the carriage builder's art and has a peculiar rival in the victoria or tulip type.

In the motor line one cannot overlook the great strides in lubrication. Makers have at last realized that a motor to give its power and operate without difficulty must be well lubricated. This lubrication does not mean plenty of oil, but the proper feeding of this oil. The result is that many simplified types are shown.

The great novelty of the Darracq stand is the new 19-horsepower four-cylinder car, cylinders cast en bloc and with 3.3-inch bore and 3.9-inch stroke. This motor has all of the intake and exhaust piping as well as the waterpiping with the exception of the connectives formed integrally with the motor casting. Both sets of valves are on the left side. This motor shows its regular rating at 1,500 revolutions per minute and it has already a credited economy of 100 miles on 4.25 gallons of essence or gasoline. The carbureter is one of its great features and is the acme of simplicity. It consists solely of a float chamber with an expansion at the side into which the jet is screwed. The jet is visible and can be replaced at any time. Above the jet is a kind of funnel through which the air is drawn and at the top of the pipe leading from the

Business Main Theme of the Olympia Show

The Olympia show is essentially a business one. It is for the manufacturers and those who want to buy or examine cars and not a society parade to offer a few hours' entertainment to society row. No extravagant attempts at lavish decorations have been made—the cars, chassis and parts being the par excellence decorations. The show is free from freaks, excepting the piston valve types of motors, which cannot correctly be put into this classification because they have been tested out for a year or more with entire satisfaction. The Olympia has a more international aspect than ever before, and it is needless to say the results will be commensurate with the conditions.



THE MONOBLOC MOTOR ON SCAT CAR

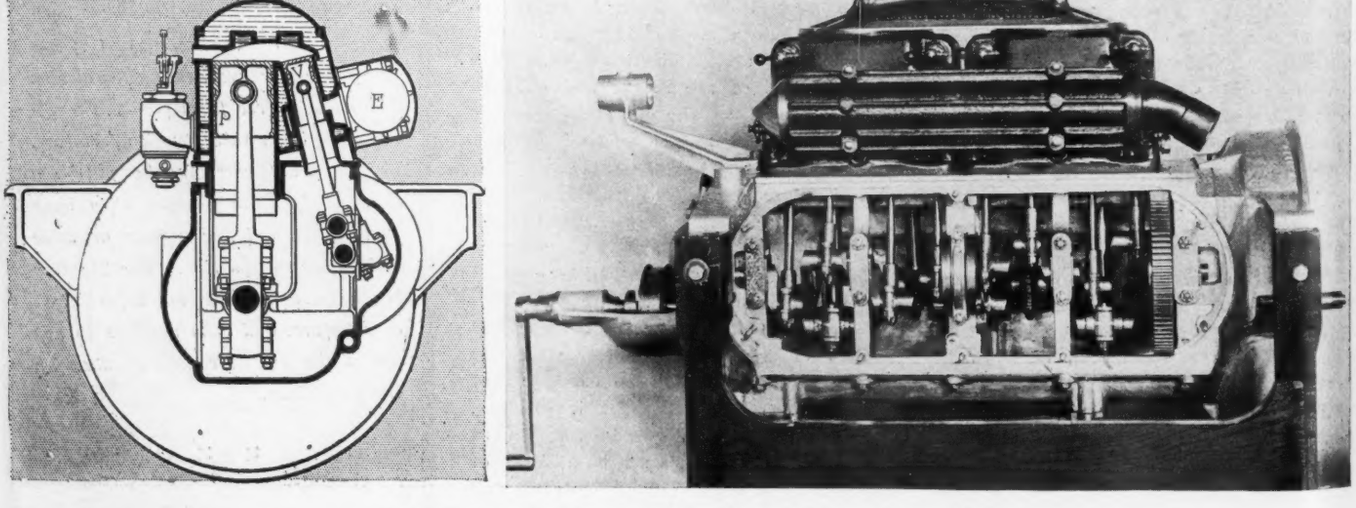
carbureter to the cylinder casting is a combined throttle and air valve, the interrelationship of which can be altered at will, so that outside air can be taken in in certain quantities with fixed movements of the throttle.

The lubricating system of the motor is also simple, in that there is not a single oil lead. The crankcase is formed with a false bottom giving a basement compartment in which an oil supply is carried. A plunger pump works the camshaft and pumps this oil into the crankcase proper, in which a determined oil level is maintained, into which each connecting rod dips. The overflow oil from the crankcase returns by gravity to the reservoir. In the reservoir is a balanced float mechanism which connects with a graduated rod which rises through the filler tube at the right side of the engine. By means of this float and graduated rod a driver can tell at a glance the exact amount of oil in his reservoir. The house of Darracq has always been associated with unique frame construction and this year is no exception to the rule. The side members of the frame are of inverted U section, and have a horizontal lip at the outside which forms a support for the framework of the body. In this way the body is lowered 5 to 6 inches, whereas the chassis clearance is not in any wise interfered with. The accessibility of the car has been constantly kept in mind. The motor is completely fitted with all its systems so that by removing four nuts and bolts, after the clutch coupling is dismantled, it can be dropped out of place. The company continues the use of a transmission brake and uses expanding brakes on the rear wheels.

Interesting De Dion Change

An interesting de Dion alteration for next year is fitting on the 8 and 10-horsepower, four-cylinder cars, a standard conventional type of live rear axle, which has been specially brought out for English purposes. It takes the place of the well-known de Dion floating axle, which has been a characteristic of these cars since their inception and which consists of a stationary axle which carries the weight, whereas the driving shafts to each rear wheel carry a couple of universal joints. In the 10-horsepower car the oil pump is not inclosed in the crankcase. The single-plate clutch is continued, it consisting of a hardened steel plate which is gripped between two bronze disks. This clutch runs without lubrication. Provision is made for keeping it cool by means of air apertures, which permit air to circulate through it. A new carbureter is fitted, the feature of which is a double concentric spraying nozzle, the two located at different levels. In addition to this there is a third gasoline aperture which is uncovered by the throttle and which allows gasoline to enter directly to the induction pipe. A change in the shaft-drive system is the inclosing of the shaft in a torsion tube which at its rear end is rigid with the differential and has a bearing support on the propellershaft at its front end. The company has a new 100-horsepower eight-cylinder type of car with cylinders cast in pairs and two pairs mounted at an angle to the left and two at an angle to the right, giving a V formation, with a single camshaft in the angle. Two magnetos are fitted and the crankshaft has the same number of throws as in the four-cylinder, two connecting rods attach to each throw. 1 has a 3.93-inch bore and 4.72-inch stroke.

A new Hotchkiss is a 12-16 horsepower type with a four-cylinder en bloc motor 3.14 by 4.33-inch bore and stroke. On this motor the exhaust outlet is water-jacketed, the object being to reduce possible back pressure of the exhaust gases on the motor. The high-tension magneto is located transversely behind the motor instead of in front of it. This location being selected, undoubtedly, to reduce the



SIDE VIEW AND END SECTION OF THE HEWETT SLIDING VALVE MOTOR

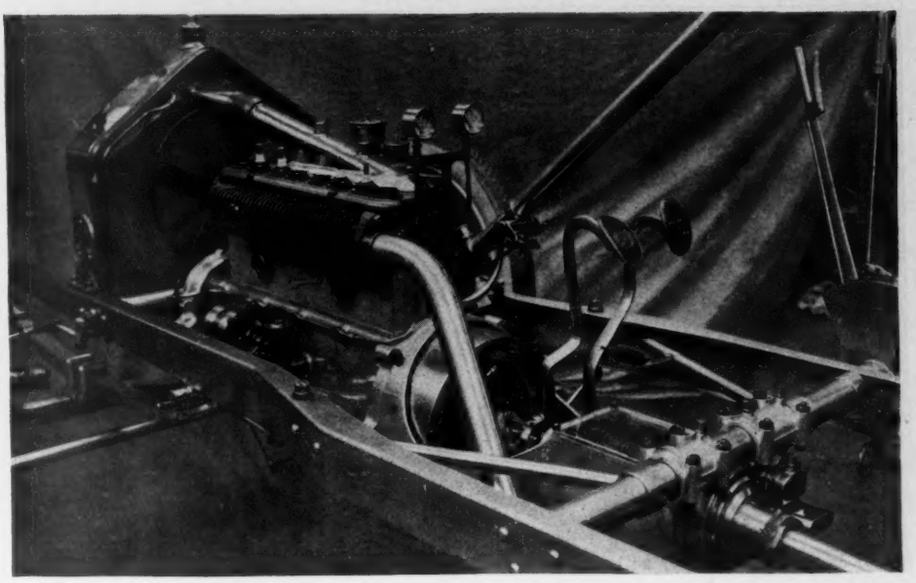
amount of wiring used. A cone clutch is continued, as is the three-speed gearset operating selectively and affording direct drive on high speed.

Hewitt Piston Valve Engine

One of the most interesting exhibits at the Olympia show is the Hewitt piston valve engine, which may be said to owe its introduction to the success of the Silent Knight principle. Unlike most of the engines with new kinds of valves, the Hewitt has been so very carefully tested for the past 12 months and has behaved so well that no doubt is entertained concerning its future. A remarkable feature of this engine is that the exhaust valve actually helps to drive the crankshaft. The sectional elevation of the motor gives a clear idea of its general arrangement, which, it will be seen, is extremely simple. The inlet and exhaust valves are contained in a water-cooled trunk disposed at an angle with the cylinders in order to permit the half-time crankshaft, whereby the pistons are actuated, to clear the main crankshaft, the connection between the two being by a silent chain inclosed in the crankchamber. The inlet and exhaust ports are placed side by side and in the illustration only the exhaust is shown, the inlet valve being behind the exhaust, from which it differs in having a trunk of only two-thirds the bore. Both piston valves are provided with a series of rings and their trunks are secured by ground-in joints. When the explosion occurs the exhaust piston travels outward and downward and thus receives a considerable impact from the explosion, the expansion of the exploded gas being consequently very greatly enhanced and utilized to a greater extent than with the ordinary mushroom valve engine.

Operation of Engine.

At the end of th firing stroke the exhaust piston uncovers its port, which is of large area and is formed with bars similar to that of the Knight engine. An analogous action operates the inlet valve which in the case of the power stroke certainly does negative work against the explosion, though this effect is almost nullified by its much smaller piston area than that of the exhaust. The rings of neither the inlet nor the exhaust pistons are at any time submitted to the direct heat of the explosion, nor at any time is the inlet port.



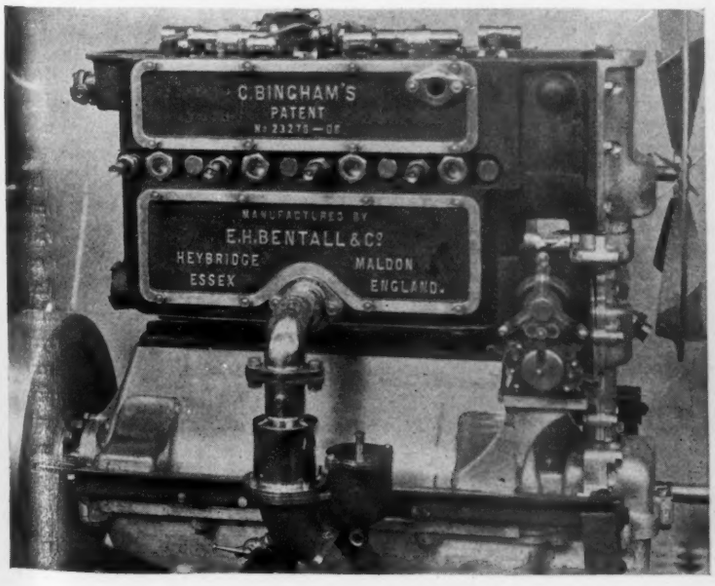
THE CROSSLEY FOUR-CYLINDER MONOBLOC MOTOR

Both piston valves are easily and copiously lubricated by the splash system and work perfectly silent, and in the tests made on the engine has shown no appreciable sign of wear. The whole engine, a four-cylinder, is extremely neat in appearance and has been adopted by Crowley, Ltd., the makers of the Weigel motors, as a standard power plant for next year.

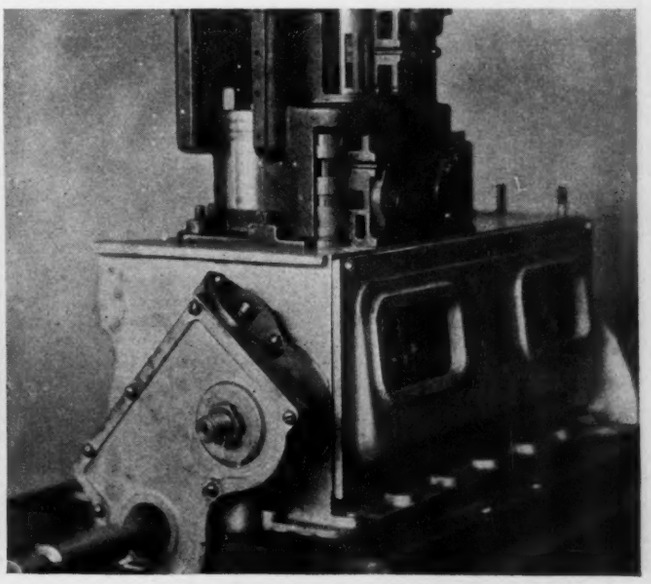
After experimenting with it for over a year, Messrs. Panhard & Levassor have decided to take up the manufacture of the Knight slide-valve engine in France, and have made Mr. Knight a first payment of $60,000. Lannstatt Mercedes in Germany and the Minerva Motor Co. in Belgium have the rights for their respective countries, and it is already clear that Knight has made a fortune already out of his motor.

Features of Sizaire-Naudin

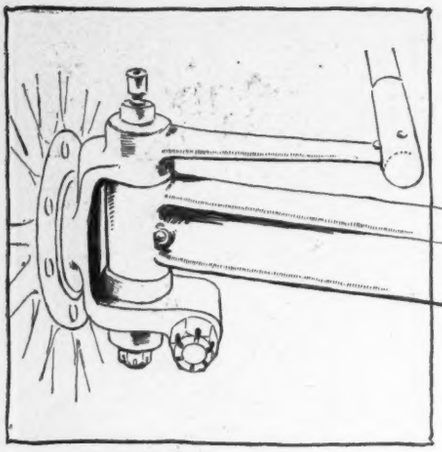
The Sizaire-Naudin cars, which have been performing so wonderfully in road contests of one nature or another during the present season, are continued in much their present form. Some modifications have been introduced, however. These motors, rated at 12.1-horsepower, have their power possibilities increased by adding practically .4-inch to the stroke, making it now 5½ inches. The gear ratio for the first speed is 9½ to 1, for the second speed 5 to 1, and for high speed 3½ to 1. The well-known transverse front spring, which is located in front of the center of the radiator, is continued, but the radiator is made somewhat higher and has a larger number of smaller tubes in



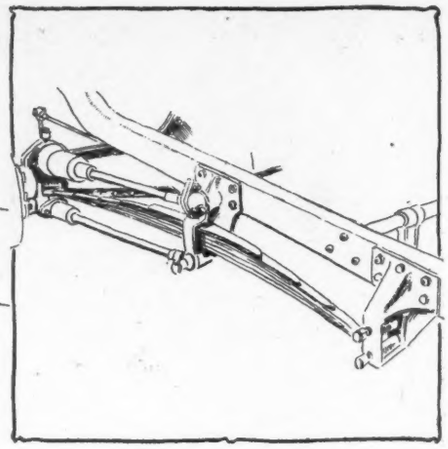
THE BENTALL SLIDE-VALVE MOTOR



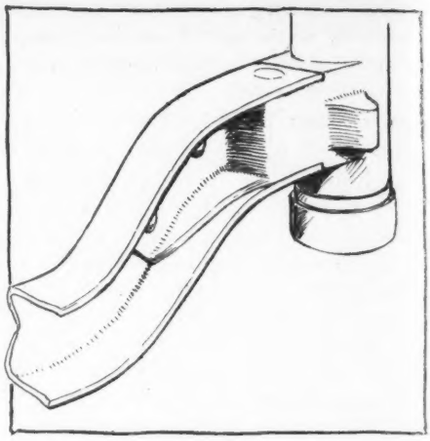
THE COOPER SLIDE VALVE MOTOR



HUMBER STEERING PIVOT



DEASY REAR SPRING



LANCIA PRESSED STEEL FRONT AXLE

it. The steering arms are now made of dropped forgings instead of being malleable castings. In order to increase speed the auxiliary air valve in the carbureters has been made larger, the intake manifold has been lengthened, and the choke tube at the lower end can be adjusted to a greater or less height around the spraying nozzle, thereby furnishing an adjustment for the richness of the mixture.

A novelty in the Berliet ranks is the four-cylinder 12-horsepower Baby with 2¾-inch bore and 3 5/16-inch stroke. It has an official rating of 12.1 horsepower, a wheelbase of 108.5 inches, 52-inch tread, and all of the earmarks of a big car, including a multiple-disk clutch, three-speed gearset, and shaft drive. The side members of the frame are dropped in front of the rear axle, three-quarter elliptic springs are fitted in the rear, and the chassis frame is stoutly built throughout. This car is considered a taxicab model. The only means of regulating the speed and power of the motor is by an accelerator, the company continuing the use of fixed ignition which it has employed for some seasons. The motor, contrary to general practice in small sizes, has the cylinders cast in pairs with valves at the left and separate intake and exhaust manifolds. The throttle valve is incorporated at the angle in the Y induction pipe. The gearbox is mounted centrally on the car.

Germain a Belgian Product

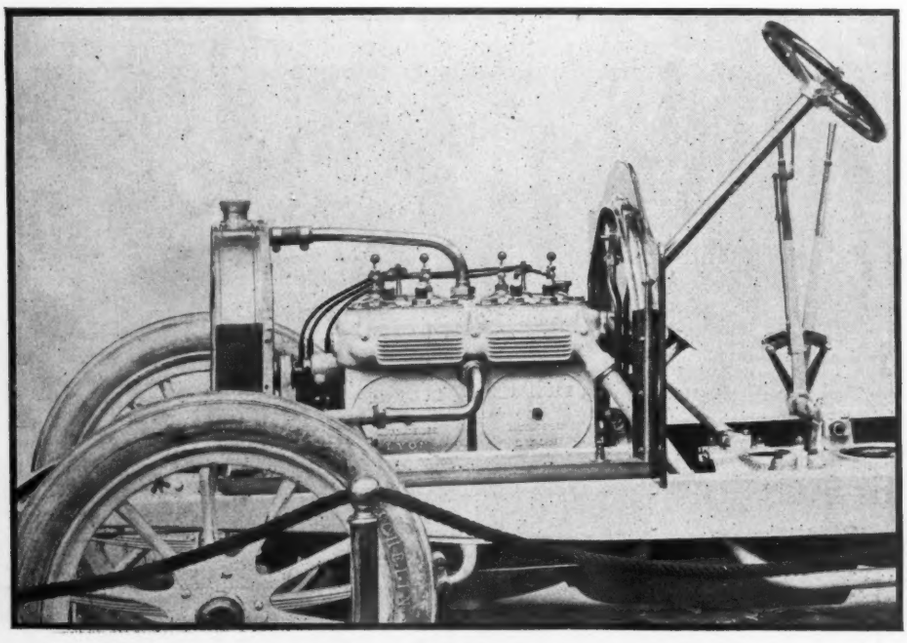
The Germain car, a Belgian product, is shown in the six-cylinder 20-horsepower type, with cylinders 3.38 by 4.33-inch bore and stroke. It has 25.6 horsepower rating and a wheelbase of 123 inches, with 49-inch tread. A feature of this car is that the Desaxe steel cylinders are employed. These cylinders are separate and consist of three parts, the trunk or cylinder proper, which is a steel tube, the cylinder head, which is a casting combining the inlet and exhaust valve chambers on opposite sides, and the jacket, which is a barrel-shape length of brass tube held in place against flanges on the outside of the trunk by means of shrunk steel rings. The water joint between the jacket and the head does not call for the use of external piping, the water connections to and from the radiator being as in the standard cars. A body feature in this car is the heavily hooded dash, which extends more than half-way back to the front line of the driver's seat, so that it in conjunction with the side doors affords valuable protection for both of the front-seat passengers. The carriage of the body is particularly low, due to a double drop in the side members of the frame, which eliminates the necessity of an extra step to reach the tonneau. The dashboard offers a second use, namely, containing the gasoline tank, which results also in a great reduction of the gasoline piping and gives a gravity flow to the carbureter. This car is fitted with either artillery or wire wheels.

On the 20-horsepower Germain car automatic timing of the ignition is fitted, which is incorporated with a spindle which drives the magneto. The automation is a centrifugal governor inclosed in a glass cage, this governor advancing and retarding the ignition with the motor speed. The lubrication of this motor is a crankcase-contained system, a gear pump in the crankcase oil reservoir feeding through passages bored in the crankcase to the crankshaft bearings, thence through the crankshaft to the connecting rod and then to the wristpin.

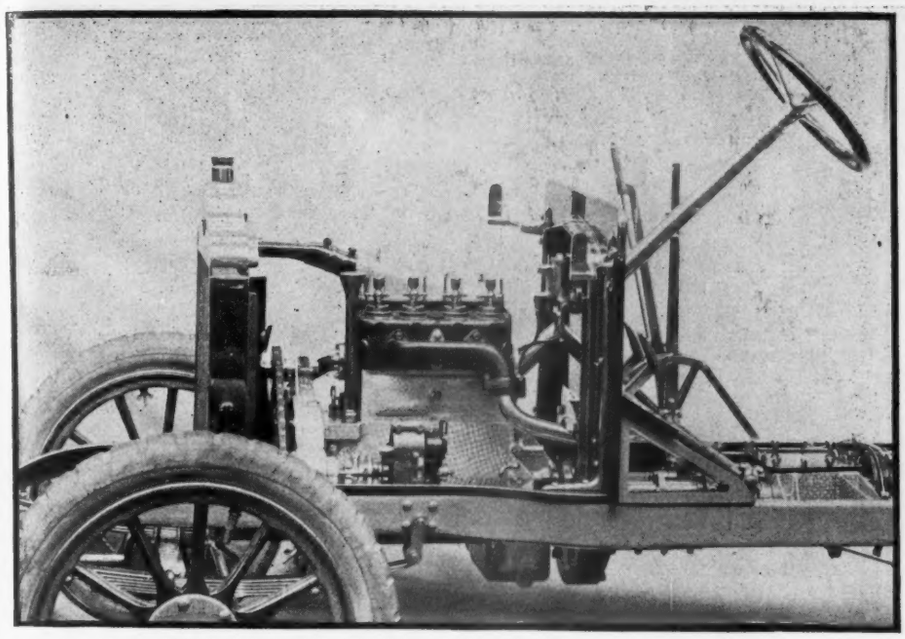
Among the many interesting exhibits of the show is the Sheffield-Simplex 14-20 horsepower car fitted with brakes on all four wheels. One illustration shows the brakes on the front wheels indicating how the steering spindle is nested in the brake drum, as well as how means are provided for operating these brakes. On these cars the radiators are mounted on the dash, Renault fashion, a crankcase lubricating system is fitted. The motor has a transverse front shaft, which drives the magneto and contact breaker. This company has a special type of aluminum body with but one entrance for the front and rear seat. It is fitted with wire wheels.

Rubber Shock Buffer on Singer

A novelty on the 16-horsepower Singer cars is the rubber shock buffer on the rear spring. The springs carry a conical rub-



ENGINE VIEW OF THE 15-HORSEPOWER LA BUIRE



SIDE VIEW OF FOUR-CYLINDER 12-HORSEPOWER STANDARD MOTOR

ber buffer and secured to the side of the frame is a bracket which takes a vertical, threaded bolt. On the lower end of this bolt is an enlargement against which the buffer strikes. Should the buffer become worn this bolt can be raised or lowered according to the necessities of the case.

The Lancia car, the pioneer of the pressed steel front axle, continues to use this type. The axle section resembles that of a pressed steel frame and into the ends are pinned or otherwise secured the curved ends of the steering knuckle parts.

On the La Buire, by way of radiator protection, two springs are used which take the entire radiator weight. These are placed at opposite sides of the radiator and rest directly on the frame of the car.

An improvement on the Humber cars is the new type of steering knuckle construction, which has an integral arm at the upper end of the jaw with a ball ending to connect with the drag link to the steering gear. The lower jaw of the knuckle has a curved continuation to which is attached the steering arm for carrying the tie-rod in front of the rear axle.

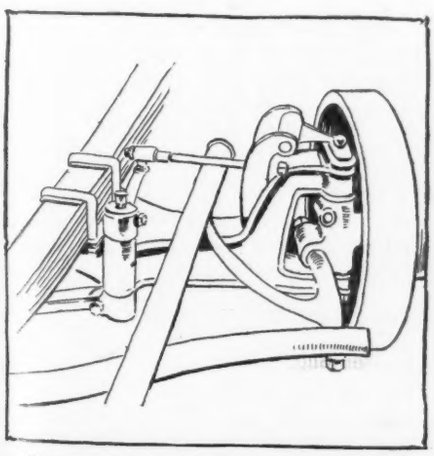
Accessability is the keynote of the Delauney-Belleville six-cylinder motor construction, the magneto, carbureter and water-pump connections all being made with thumb-screw nuts, so that they can be readily detached without the use of any tool.

The principal exhibit of the Panhard firm is a 30-horsepower six-cylinder landaulet, all six cylinders of which are cast in pairs. The valves are on opposite sides and there is a bearing between each adjacent two crankthrows. Bore and stroke are 3.54 and 5.1 and power is obtained at 900 revolutions per minute. The high-tension magneto is so arranged that for advancing or retarding the ignition the whole magneto can be bodily swung one way or the other about the armature as center. A multiple-disk metal clutch running completely submerged in oil is used. The gearbox has a four-speed set, with direct drive on fourth gear; the drive is by propellorshaft. In addition to the ordinary metal-to-metal brakes, the camshaft can be slid bodily along when specially profiled cams come into operation on the exhaust valves and turn the engine into an air compressor. In the 12-15-horsepower, four-cylinder light car chassis the engine dimensions are 3.14 by 4.72 and the cylinders are cast en bloc, complete with integral exhaust and inlet manifolds. All valves are on the same side. Thermo-syphon cooling is used and vertical tube radiator has a belt-driven fan. Magneto timing is used and control is by accelerator only. The leather cone clutch is so mounted as to be easily detachable without intertering with any other mechanism. Springs act on the radius rods and a triangular torque member is installed. Operation of the hand brakes is through steel ribbons. Both these models have an ingenious lubrication system which delivers an amount of oil proportional to the load. A plunger pump or camshaft pumps the oil from the crankchamber to drips on the dashboard, whence it flows to the main and other bearings. Drips are connected up to the carbureter so that when the engine pulls hard the large suction draws more oil through the drips, thus oil delivery decreases as the throttle is closed.

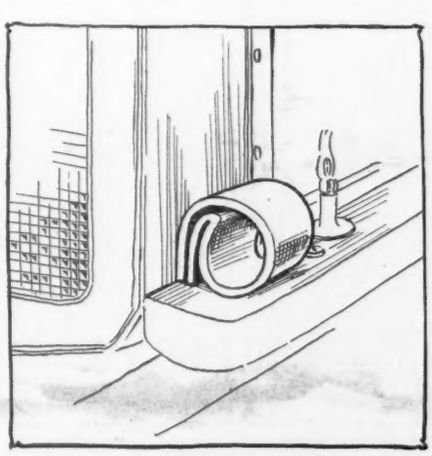
Some of the new features in the 8-horsepower, two-cylinder and 12-horsepower and 16-horsepower, four-cylinder Humber cars are a glass panel in the crankchamber so that the level of the oil can be seen; the magneto drive is new; two equal sized and pitched spun wheels are fixed, one on the driving shaft and the other on the armature shaft. An internal toothed sleeve slides over them and is kept in position by a slip, thus the timing of the magneto can easily be altered without dismounting.

Some of the principal features of the new 12-14 and 20-horsepower Crossley models are the four-cylinder engine cast en bloc, all valves being on the same side, springs tappets covered with removable plates. The tappets have silencing springs and dashpots. Front wheel brakes are used with operating mechanism actuated through rods passing through the steering pivots, a metal clutch similar to the expanding brake on propellorshaft or transmission.

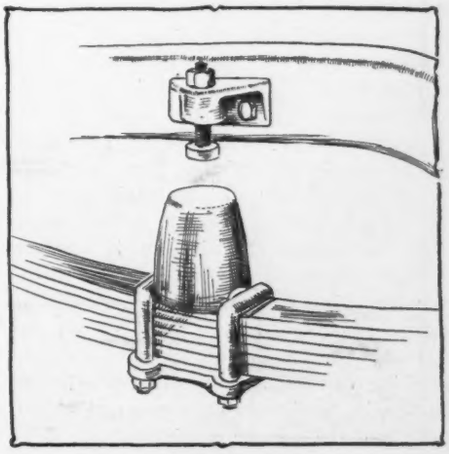
The Wolseley-Siddeley has a 12-16-horsepower model with four-cylinder engine cast en bloc, and worm drive below the differ-



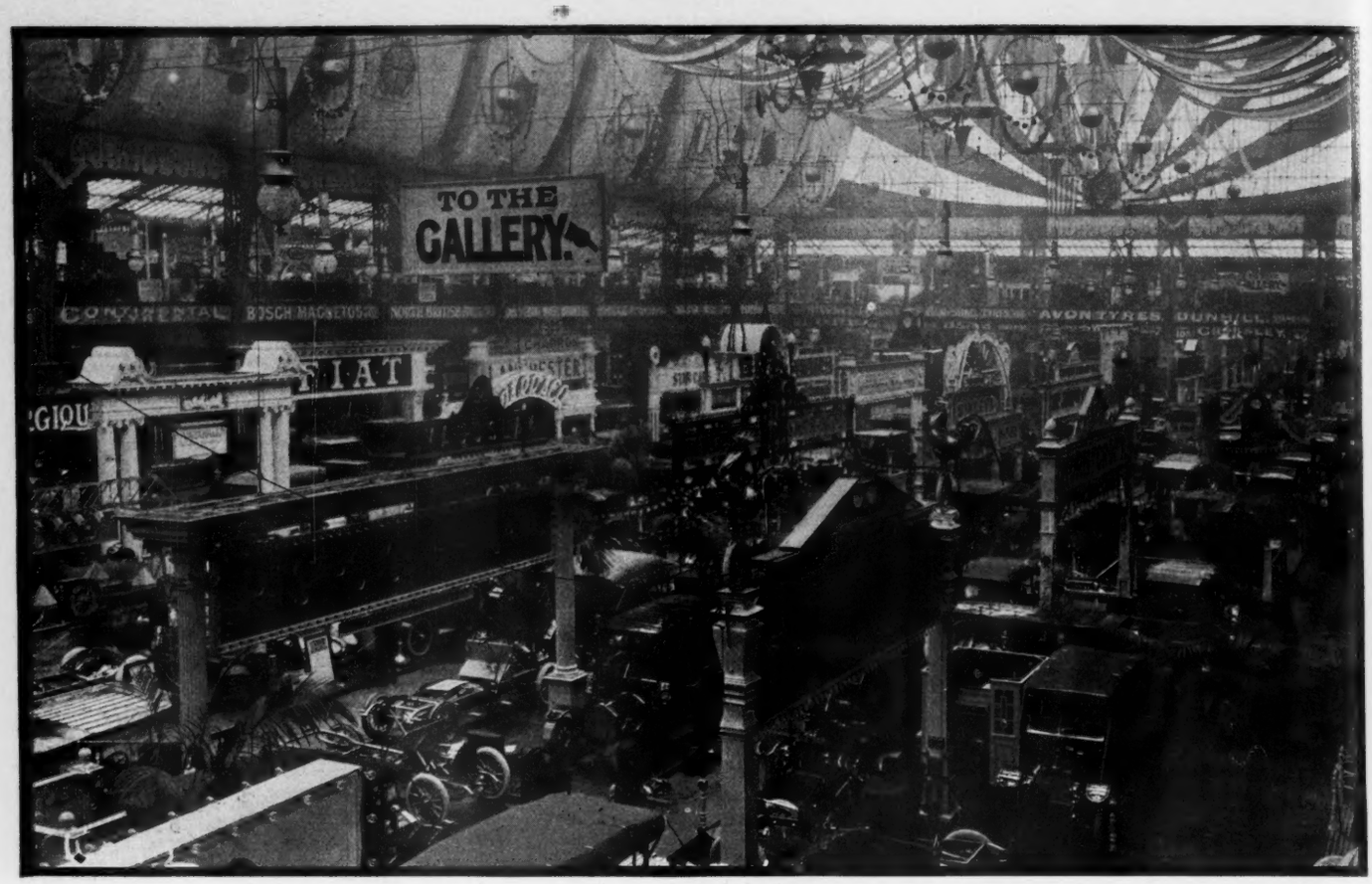
SHEFFIELD-SIMPLEX FRONT WHEEL BRAKE



LA BUIRE SPRING RADIATOR SUPPORT



SINGER SHOCK ABSORBER



General View of the Olympia Show as Seen From the Gallery

ential, transmission, multiple disk clutch. Timken roller bearings are fitted to all four wheels. The six-cylinder 40-horsepower model has copper waterjackets common to all cylinders which are cast in one piece. The waterjacket is fixed on with innumerable screws. The big ends of the connecting rods on both models are formed with spoon-shaped scoops which lift oil out of the special troughs in the crankchamber.

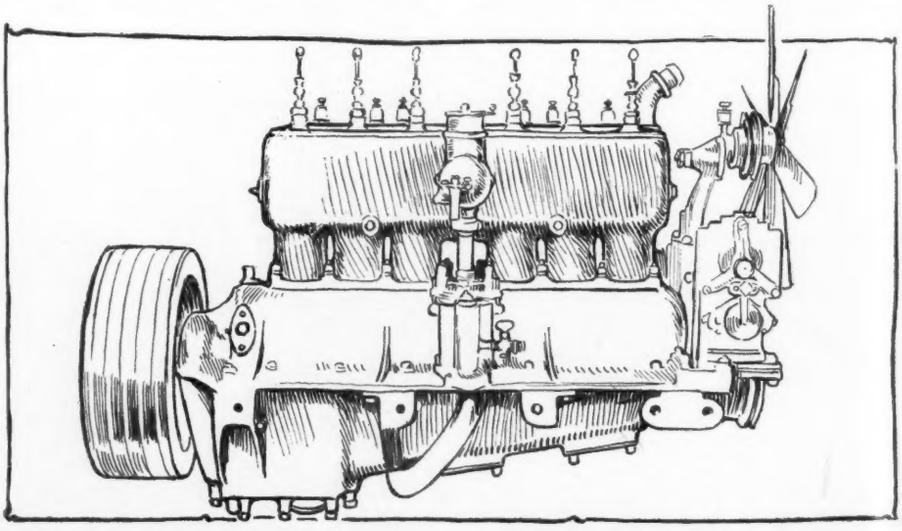
The five Daimler models are all fitted with silent-Knight, sliding-sleeve engines, the cylinders being cast in pairs. The 15-horsepower model has a bore and stroke of 3.14 and 5.1 inches, leather cone clutch and worm drive, the worm being below the differential. The 22-horsepower, 3.7 by 5.35, 38-horsepower, four-cylinder, 33-horsepower, six-cylinder, and the 57-horsepower, six-cylinder, all with four speeds and bevel drive. The eccentric shaft is driven by silent inclosed chain, and magneto mounted across the front of the crankchamber being driven by gearing direct from the crankshaft. The suspension is by semi-elliptic springs, each fitted at its rear end with a double spiral spring shock absorber. Lubrication is another trough system with special splash-fed cups for the main bearings. Oil is also splashed into a cup which serves a tell-tale on the dashboard and shows if the lubrication is working correctly. The carbureter has a double jet, each serving a separate choke tube, and the smaller one is used for slow running, the large one being cut in and out by a movement of the throttle lever. Rudge-Whitworth detachable wire wheels are employed as a standard fitting.

Swift's Small Car

The small Swift 7-horsepower, single-cylinder engine, 4⅛ by 5, develops 12-horsepower. There is no aluminum in this car at all, the crankcase and gearbox being cast iron. Ignition is by high-tension magneto, and thermo-syphon cooling with a quasi-honeycomb radiator is used. It has propellorshaft drive with three speeds and reverse gearset. The back part of the chassis is slung on three-quarter elliptic springs. Plain bearings are used throughout, and the rest of the specification is as complete as far more expensive cars. This car is made by the Austin company.

An interesting car on the Swift stand is a 10-12-horsepower Colonial model in which larger wheels are used to give high road clearance. This effect is further enhanced by a speed reduction gear incorporated with the differential, which reduces the diameter of the crown bevel and therefore of the case 6 or 8 inches.

The Bedford car is comparatively a new-comer to the British market and if not American in construction is certainly American in design. This car is made in one model only, a 15-18-horsepower, four-cylinder machine with Goodyear detach-



Intake Side of Delaunay-Belleville Six-Cylinder Motor

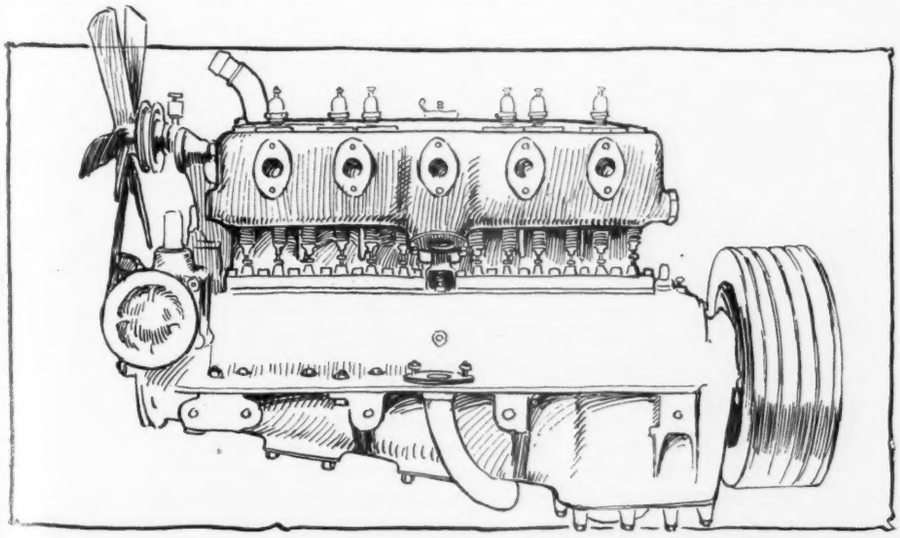
BUSINESS-LIKE ASPECT OF ENGLISH SHOW HELD AT OLYMPIA

able rims. The engine cylinders are 3.74 inches square and cast in pairs with rocker-actuated, overhead valve, a la Buick. Water and oil pumps are mounted at the top and bottom of the crankshaft driven off the middle of the camshaft. The main bearings are carried entirely by the upper portion of the crankcase. Ignition is by low-tension magneto which delivers the current to an induction coil with a high-tension distributor to which can also be coupled up, if desired, an accumulator. A Stromberg carburetor is used. There is a two-speed planetary gearset with low speed and reverse operated by pedals. The propellorshaft is housed in a tubular torque member, and the suspension is by elliptics in the rear, and semi-elliptic in front. Hyatt roller bearings are used throughout.

Oldsmobile-Type Adams.

The 10-horsepower Oldsmobile-type Adams with pedal operated, two-speed planetary gears remain unaltered, but there is a new four-cylinder, 16-horsepower car with gate, three-speed gearset in standard lines.

The New Engine Co. still adheres to placing the engine in its N. E. C. car under the driver's seat and utilizing worm drive.



EXHAUST SIDE OF DELAUNAY-BELLEVILLE SIX-CYLINDER MOTOR

These cars are now fitted with the Lanchester type of spring, one-quarter elliptic on the rear wheels.

The new voiturette Waverly has a two-cylinder V-type engine under the bonnet and the drive is direct to the back axle, where there is a two-speed gearbox and no differential, one of the rear wheels running idle all the time. Double Lanchester suspension wheels.

The Napier cars remain practically unaltered from last year's design except that in the six-cylinder cars the bottom half of the crankchamber is made of pressed steel. A new type of carbureter is used in which the jet consists of an annular slot which can be opened or closed to any desired degree by a rotating shutter. A ratchet sprag is fitted to the propellorshaft with a neat arrangement which prevents the sprag operating when the reverse gear goes in. A new 15-horsepower Colonial model has been introduced, the engine dimensions being 3¼-inch bore by 5-inch stroke, cylinders cast en bloc with the flywheel in front, three-speed selective gearset in one with engine and worm drive. The car on exhibition has a patent hood which can be taken off and forms a tent, the body is fitted with cooking stove, etc.

The Austin models are the same as last year with only slight detail improvements. The piece de resistance is a caravan on a 60-horsepower, six-cylinder chassis. The car carries six people and also carries a completely-equipped kitchen.

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Automatic and Accessible

THE close student of 1910 cars both in this country and in Europe is immediately impressed with two factors which are annually entering more and more into the make-up of motor cars, namely, accessibility and the automatic feature. The accessibility feature is most apparent. Two years ago there were cars on the market in which the timer or commutator could not be taken off without loosening and shifting the radiator, so inaccessible was the timer location. At that time the same was true of the water pump on many cars. In those days it was accepted as correct that if the clutch facing had to be replaced it was imperative to remove the gearbox. All this is changing, thanks to the buyers of cars, for it is the buyers and the salesmen who have impressed on the designers and factory people the great lessons of accessibility. Few designers drive cars enough to learn the great lessons of accessibility and when they do drive them and anything goes wrong it is generally the factory repairman who effects the repair and not the designer.

TODAY motor accessibility is greatly on the increase, but there is plenty of room for improvement. It is now generally possible—if necessary—to remove the fan behind the radiator without taking off the radiator. It is also possible generally to change the tension of the fan belt without having to unlace the belt or get a new one; it is possible now to take off the water pump without in anywise molesting the radiator or magneto; the magneto on many cars can be removed in a few seconds and a new one added; the clutch can be taken out without altering in any wise the gearset or motor; and, in fact, on the most approved and up-to-date machines practically any unit can de detached without interfering with the other units or systems of the car.

BUT in spite of what has been done there is room for more. Few cars have readily interpreted means for showing the oil level in the crankcase compartment of the motor; in fact, on some this is so deplorably bad that the only certificate the driver has of ample lubrication is the smoke cloud back of the car and as soon as it vanishes he gets onto uneasy street. There is scarcely a car made in which the driver can see at a glance the exact status of his crankcase oil level, in spite of the fact that a vast majority of them depend solely on the crankcase splash for oiling the cylinder walls, pistons and crankshaft and connecting rod bearings. There is a trend, however, to fit some indicating device so that without having to lift the bonnet or even get out of the seat the driver is enabled to know exactly the quantity of oil in his motor, in addition to knowing whether the different feeds are sending the requisite number of drops per minute to some of the desired parts.

LUBRICATION is one of the imperative parts of the motor system, yet many cars cannot without great difficulty drain the dirty oil out of the crankcase compartments. During this season there are cars on the market in which to do this the lower half of the crankcase has to be dropped. On the other hand are cars in which there is a little trap door at the bottom of the bonnet under the motor, and which gives access to pet cocks through which the motor oil supply can be drained off in a few minutes. In some these pet cocks are so small that 15 or 20 minutes are needed; this is quite useless. A large pet cock can be made as reliable as a small one and if the oil can be drained off in 2 minutes there is no need of having to waste 20.

Keep the Band Playing

ENTHUSIASM is the life blood of a new industry; not that enthusiasm bred of the few directly concerned with that industry but that land-broad enthusiasm in which those who at present cannot enter the industry or participate in its pleasures or profits but who are interested in it because the big majority of the people are interested in. Up to the present the motor car industry has essentially been one of enthusiasm. From New York to San Francisco and from Duluth to New Orleans the different states are filled with talk of the all-conquering motor car; the class, daily and weekly press devote columns, pages and whole issues to the achievements of the car; the magazines sing its praises from month to month; the cartoonists of the land, recognizing its revolutionizing nature, have never failed to include it in their story-telling sketches; the politicians have realized the car value in campaigning; in fact everybody have grasped its worth and talked it. This universal car talk; this never-ending wave of motor-vehicle sentiment; the never-ending panorama of motor events beginning New Year's morning each year and barely ending by Christmas have all combined to motorize a continent, have combined to make people buy cars often whether they believed in them or not, have made them car enthusiasts after they have jumped into the ranks, and have been the big power behind the throne in forging the industry ahead at the unprecedented pace it has set during the last 4 or 5 years.

DON'T let this enthusiasm wane, no matter what the cost. Today the motor vehicle is the all-star industrial attraction of the western hemisphere. This premier position must not be dropped, for once dropped it will be difficult to regain. Many may criticize that the status of the industry is such that it could not possibly be ousted from its exalted position. There is no position so high and exclusive but it cannot be lost. France has lost her premiership in the motor business through lukewarmness. She did not think she needed a show, a big race or anything else; today this same France is acknowledging to the world that the center of European motor activities has been moved across the channel to London, where the great Olympia show has supplanted the heretofore unexcelled Paris salon.

THERE are a few ways in which America can lose her motor enthusiasm, and generally with enthusiasm goes prestige. Shows, races, hill-climbs, reliability contests, individual car performances, private tests, sociability runs and a score or more of contests of one nature or another are great sustainers of the industry, and those who turn their backs on these are working an injury to the industry. Whether a manufacturer believes in a certain form of contest or not he is morally bound to give his support in some manner or another for no other reason than that of keeping the car everlastingly to the front. The maker who does not believe in anything of this nature, who is against shows and everything else is a sort of parasite feeding on the results bred by other manufacturers and not in any wise willing to contribute to the general fund of motor enthusiasm. Shows must be continued even if they do not always come up to the makers' conceptions of what they should be as business getters. If shows are dropped a big slice will be cut off the motor enthusiasm of the land. The same is true of road racing, track racing, economy tests, hill-climbs, reliability tests, gymkhanas and tours. All are needed, all play their little part in working up the big sum total of motor enthusiasm and if makers cannot support one they should support another.

UNCLE SAM HEARS REPORT ON HIS HIGHWAYS

Office of Public Roads Tells of Object Lessons It Has Given During the Past Year

WASHINGTON, D. C., Nov. 27—The annual report of the secretary of agriculture, made this week to President Taft, sets forth the fact that the office of public roads has continued the work of aiding road improvement by studies, experiments, and object lessons. Proper construction and maintenance of public highways engages public and official attention to a great extent, and the office of public roads has proven its usefulness to the general public more emphatically than ever before. The adoption of state aid in the construction of public roads by more than half the states and the consideration of the question by the remainder, together with large bond issues by many counties, are an index of the general interest being shown in the work, and have occasioned a great demand upon the office for advice and assistance. These have been given to the fullest extent compatible with the resources of the office, and have brought about more active co-operation and larger material results than ever before.

During the past year especial attention has been given to object-lesson work. The purpose of these object-lesson roads was to give elementary instruction to local road-builders and to demonstrate the possibilities of road improvement. The policy of the department in this work leads neither to extremes of conservatism nor radicalism, but toward pointing out the most profitable use of material and means at hand in a given locality. In pursuing this policy communities with abundant resources have been encouraged to use them more freely and thinly-settled regions have been protected against results of enthusiasm for expensive roads, and materials have been proven available which, until recently, had been regarded as of little value.

Second in importance only to object-lesson work is the experimental work of the office. The most important problem considered has been that of preventing the destructive action of motor car traffic on costly macadam roads. In working out this problem experiments have been made to secure satisfactory binders and dust preventives within reasonable cost. Excellent results have been attained in the use of asphalt, tar, and other bituminous binders, waste from sugar refineries and wood pulp mills, and other by-products. It was largely to consider this question that the greatest road convention ever held was convened at Paris, France, in which twenty-nine countries participated, the director of the office of public roads being chairman of the commission of three representing the United States.

Especial attention has been given to experiments with blast furnace slag—alone and in combination with other materials—in the construction of roads, to find a way to utilize the large quantities of this waste material available. The sand clay road has been found so satisfactory in the south that it has been introduced into several of the western states, notably, Iowa, Kansas and Nebraska. The construction of such roads is expected to prove of great value in the trans-Mississippi states.

REPAIRING COLORADO ROADS

Denver, Colo., Nov. 26—The Rocky Mountain Highway Association is pursuing a vigorous course in its work of building and repairing the roads of Colorado. The ultimate object of the association is to make Colorado the banner state of the union for good roads, and every effort is being put forth that will bring results. The aid of the motorists of the state has been enlisted and with their co-operation a great deal of work has been accomplished. Every motorist registered at the city hall in Denver has been supplied with postal cards bearing the following message:

"In using this card some discretion should be exercised, and the card must not be used to serve personal prejudices. Its object is to notify the highway association of any bad pieces of roads, bad bridges, ditch crossings or ditch overflows. State plainly the location and the conditions. The highway association will take up the matter with the proper authorities and your name will not be used in connection with the matter."

On the opposite side of the card is a blank space for the motorist to describe the condition and location of any bad roads he discovers and any other details he deems necessary to furnish. As these cards are returned the proper authorities are notified and the necessity of repairing the roads is urged upon them, the officials of the association keeping at it until the work is completed. The last legislature passed a bill providing for a highway commission whose members should be appointed by the governor before December 1. The governor has not signed the bill yet, as there is no appropriation available to pay the commissioners until after January 1. The Rocky Mountain Highway Association has notified the governor that if he will make the appointments at once the association will arrange with the officials to serve without pay until the first of the year. This would greatly facilitate the work, as the commissioners could be outlining their plans and also be getting ready for an active campaign beginning January 1.

The law authorizing the appointment of these commissioners was passed for the purpose of building public roads in Colorado, including a highway between Denver and Fort Collins, which ultimately will be extended through Wyoming to Yellowstone park. Unless the governor appoints the commission, the provisions of the law which require the work on the road to be commenced within 6 months cannot be carried out because the commission must select an engineer to do the work and arrange for the employment of prisoners of the state penitentiary. If work is not started very shortly the members of the Rocky Mountain Highway Association fear the law will be practically annulled. The commission also is entitled to use internal revenue funds, collected by the state from the government land sales. The association claims that if the state is not ready to pay its appropriation the commission should be appointed so it can make use of the internal revenue funds.

Coming Motor Events

DECEMBER

25-Jan. 1—Show at Columbus, O.
28-29—Philadelphia mid-winter reliability run.
31—Opening of Grand Central palace show, New York.

JANUARY

7—Closing of Grand Central palace show, New York.
8-15—Madison Square garden show, New York.
17-24—Philadelphia show.
24-29—Show at Portland, Ore.
24-31—Show at Washington, D. C.
24-29—Ninth annual Detroit show.

FEBRUARY.

4-6—Mardi Gras track meet, New Orleans.
5-12—N. A. A. M. show, Chicago Coliseum.
14-19—Show at Hartford, Conn.
14-21—Show at St. Louis, Mo.
14-18—Annual show at Buffalo.
19-26—Show at Newark, N. J.
19-26—Inter-mountain show, Salt Lake City, Utah.
21-26—Show at Binghamton, N. Y.
21-26—Annual Cincinnati show.
22-27—Milwaukee show.
28 to March 5—Show at Kansas City.

MARCH

5-12—Boston show.
21-28—Denver Motor Club show.

SWEDEN PREPARES FOR TEST

Stockholm, Nov. 17—The third annual winter reliability and endurance trials of the Royal Automobile Club of Sweden will be held during the latter part of next February. The distance to be covered by the contestants will be about 315 miles on a 3 days' schedule. The course will be from Stockholm to Gothenburg. There will be two classes of cars—one class for regular stock cars as per manufacturers' catalogs—which will compete for the winter cup or trophy, and the other for cars entered and driven by amateur drivers, competing for the Gothenburg cup or trophy. There again will be American cars in, the Ford and Cadillac, which did well previously. Some United States-made cars not yet handled in Sweden are likely to be starters, the Mitchell and Buick being mentioned.

SPEARE REGIME IS CONTINUED BY THE A. A. A.

NEW YORK, Dec. 1—Special telegram—Placing itself strongly upon record as being unequivocally opposed to reckless and unfair use of the highways by inconsiderate operators of motor cars, the annual meeting of the A. A. A. today re-elected Lewis R. Speare to its presidency, expressing unanimously its approval of his occupancy of the office during the unexpired portion of the term of William H. Hotchkiss, who resigned to become superintendent of insurance of New York state. The 1910 list of officers is as follows:

President—Lewis R. Speare, Massachusetts.
First Vice-President—Robert P. Hooper, Pennsylvania.
Second Vice-President—Frank M. Joyce, Minnesota.
Third Vice-President—F. C. Donald, Illinois.
Treasurer—H. A. Bonnell, New Jersey.
Secretary—Frederick H. Elliott.
Chairman of the Executive Committee—A. G. Batchelder.
Chairman of the Legislative Committee—Charles Thaddeus Terry.
Chairman of Touring Information Board—Powell Evans.
Chairman of Contest Board—S. M. Butler.
Chairman of Good Roads Committee—George C. Diehl.
Executive Committee—S. A. Miles, H. G. Smith, Alfred Reeves, Oliver A. Quayle, C. H. Gillette, James T. Drought, John Bancroft, W. E. Metzger, Edwin S. George, Paul C. Wolff, Frank G. Webb, J. P. Coghlin, H. M. Rowe, F. C. Battey, J. H. Edwards, Louis W. Hill, William R. Innis, A. D. Converse, A. E. Leech, G. W. Allen, A. E. Coffin, A. H. Knoll.

On the first day of the meeting the opening item was the dissolution of the old stockholding corporation under the New Jersey law, and the substitution of a more flexible charter under the Connecticut statute. The report of Chairman Terry was accepted in its entirety, and the necessary papers were signed by all the directors present at the meeting. Reports of the various boards indicated that the work of the association has prospered substantially in the past 12 months, and the association is in a generally prosperous condition.

Chairman George C. Diehl of the good roads board referred to the successful Cleveland convention, and predicted something even more epochal at St. Louis next year. Chairman Terry of the legislative board presented a very exhaustive report and outlined the general plan that has been proposed for the first national legislative convention, which will be held in Washington, D. C., next February. At that time the national registration bill will be reintroduced into congress and it is expected that a public hearing on the measure will be secured during the week of the convention. The uniform state motor vehicle law also will be brought prominently before the members, and efforts will be made to secure its introduction into the legislature of those states which either possess no effective laws or those which in certain instances have been shown to be unreasonable in their provisions.

Chairman F. B. Hower of the contest board told of the season's contests and indicated unmistakably that he did not desire a reappointment. In recognition of his indefatigable activities, a unanimous resolution of thanks was passed.

Chairman Powell Evans of the touring information board told of what had been accomplished in this direction and what was being outlined for the future. Treasurer H. A. Bonnell's report gave a balance of $12,000 in the treasury.

Secretary F. H. Elliott's figures placed the present membership at 25,759, represented in thirty state associations and 225 clubs. Six new state bodies have been formed during the past year.

Among the recommendations of President Speare was one concerning the disposition of the Glidden trophy, which probably will never be competed for again. The consensus of opinion is that the 1910 tour shall be known as the A. A. A. national endurance run, with runs so strenuous in character as to prove the undouted reliability of the contestants, but minus a conclusion which shall positively require an individual winner.

It was decided that hereafter the fee for individual members shall be $5, the former price having been $3. The association offices will be continued at 437 Fifth avenue, at least for the next 2 years.

Due recognition was given of the assistance rendered by the National Association of Automobile Manufacturers in the carrying on of the work of the national organization. Powell Evans, of the Automobile Club of Philadelphia, desired that the association consider the possibility of extending its activities into the field of aeronautics, which, in its developments, he said, bade fair to be a kindred pastime to motoring. This was referred to a special committee, of which Mr. Evans was made chairman.

RESCUE LEAGUE IS FORMED

St. Louis, Mo., Dec. 1—The Clayton Motor Car Co.'s Rescue League, of which Dr. G. C. Eggers is president and which is building a new steel and concrete garage on Forsythe road in St. Louis county, is preparing to install a unique system of trouble boxes throughout the county. John Crosby, manager of the company, has announced that the system will be in operation as soon as a suitable contract can be completed with a telephone company. A large number of the boxes already have been made and the number will be increased as fast as it is found necessary. These boxes are somewhat similar to those used by the city police. They will be free to all members of the league. When one becomes a member he will be given a key which will open any of the various signal boxes. When anything happens to the car of any member all he will have to do is to go to the nearest signal box, open it and get into communication with the headquarters of the league, which will be at the new garage on Forsythe road. If the motorist merely happens to be out of gasoline a sufficient supply will be rushed to him. If a tire has blown out one will be taken to him as soon as the act can be accomplished. In fact, whatever may happen to him, even if his car is so wrecked that it has to be towed or hauled into the garage, his wants will be attended to without delay. The Clayton company will keep on duty a sufficient force of experienced men to attend to the troubles of all its members under ordinary conditions. The new garage will be equipped with a charging plant, a repair shop, parts and supplies, and a waiting room. The boxes are so constructed that when one inserts his key it cannot be released until one of the trouble men appears with a second key, which members are not permitted to carry. The object of this precaution is to prevent false alarms. Each member upon calling is required to give his number as recorded upon the league's books. Of course, one might give a false number were he disposed to annoy the trouble men as a practical joke, but as he cannot release his key, which also is numbered, he would be detected when one of the men responded.

TRADE MEETINGS IN NEW YORK

New York, Dec. 1—Special telegram—At its headquarters on East Forty-second street, the Association of Licensed Automobile Manufacturers Tuesday held a meeting of all members, with a most generous attendance. President Charles Clifton occupied the chair as he did at the meeting of the executive committee on Wednesday. No information was forthcoming, though it was intimated that all the members of the A. M. C. M. A. had been given an opportunity to obtain licenses upon reasonable terms.

It was natural that Chicago show matters should occupy most of the attention of the executive committee of the National Association of Automobile Manufacturers at its monthly meeting held this afternoon.

The committee of management of the American Motor Car Manufacturers' Association, with Chairman H. O. Smith presiding, held a session Tuesday at the association's headquarters, its time being principally occupied with Grand Central palace show arrangements. It also is understood that the Selden patent came in for some attention.

Because of these three meetings, and the annual session of the American Automobile Association, the city is filled with prominent motoring lights, both in the trade and in the sport, and in consequence there is great activity in local circles.

FRENCH VIEWS ON ENGLAND'S OLYMPIA SHOW

PARIS, Nov. 21—French critics or experts are reluctantly writing too favorably about the big Olympia motor car show. While they bring out the fact that the British makers have been improving their cars and are showing quite a few novelties, even if nothing of a real sensational nature, they show plainly a regret that there is no Paris salon this year.

One writer, a man little known outside of Paris, and who signs his article as J. Marsillac, has what Frenchmen will call a real sensational article on the salon question in one of the many Paris weekly trade papers. In part his article is as follows:

"The motor car show of London will be closed soon. It marks distinctly the debut of a new era in motor car commerce; it is the crowning of an edifice which has patiently and slowly been built up by British tenacity; it marks the end of France and especially the end of Paris as the center of the world's market for mechanically-propelled vehicles.

"These words will surprise you without doubt, but they are only the brutal truth. And it could not be otherwise. Just follow for an instant what I will say, and try for a moment to forget that you are a Frenchman, a Frenchman who admires with good reason, but sometimes with exaggeration, all the national or native producers. Just put yourself in the skin of some one without a nationality, who has no strong technical knowledge, in other words, as they say in England, of a sir who has just passed along the street. Our friend follows the motor car movement without being intimately connected with it, but taking interest in it. It is first the period of starting or of debut, a glorious time, where the names of the great races ring like so many victories; they are the Gordon Bennett races of time far away, and the two or three big makers who compete are French. Then, after the ridiculous victory of Edge and the brief discovery of Ireland, came our marvelous triumphs in Germany, in Auvergne, at Mans, everywhere.

"Shortly after the race rules are changed, to leave to the French industry, which, in fact, is more important than that of its rivals, a numerical superiority in the way of cars entered for a race. It was a poor step and its effect was bad. Elsewhere they were used to see us fight one against ten, and the change in rules gave way to stringent attacks against us.

"The years pass by and the race formulae are modified, yet our star begins to pale. But if our success in races was not any more pronounced, at least our salons continued to be every winter the rendezvous of the rich motorists of the whole world, also of the agents who came to fight for the agency of our cars; the sole title of 'French car' seemed a guarantee of good value and of up-to-dateness. To exhibit at the grand palace resulted in the making in the country where it was made of a foreign car, because one knew that a manufacturer did not dare to come to show his cars in Paris if he was not certain that he could figure there preeminently or at least honorably.

"And, all of a sudden, last year, without one knowing the importance of the act taken, we heard of the suppression of the grand prix. Abroad, in foreign countries, the decision was characterized with just three words, namely, 'Frenchmen are afraid.' Now, why should we have cause to be afraid, unless it were because we feared defeat? And why should we fear not being able to win unless it were because we were sure foreign cars were equal if not superior to ours? It was a simple way of reasoning and met with success.

"And now they go and do away with the salon because it is too expensive! The Englishmen have well understood, and their slowness in matters of invention and progress has been compensated by their everlasting effort. They have reconquered their national market, they have established in their colonies a sure and progressive renown; they are coming along or pushing their way into the European market just like people who are sure of tomorrow, because in a normal construction they bring along a guarantee of honesty, a guarantee for their word, deference to the public's wishes."

"The British engineer," says another writer, "whose general knowledge is inferior to that of his German, American and French colleagues, knows not much about technique. It is a heavy handicap for him when a new industry arrives, and he needs many years to fill his initial retard. The Englishman is dominated by us in locomotion and motor cars, by the Germans in electrical machinery, by the American in general mechanics, in public works and working organization. That is for his bad side.

"On the other side, this absence of theoretical education spares him many trials or tests, which are costly, arduous and of long duration, just because the need of them does not appear to him. In some circumstances it really is an advantage because the technician is generally either too modest or too audacious. The English engineer not having original ideas, but being a model employer, is liable to put to good use any good idea that is brought to him. Somebody always brings him good ideas, and this same body is the public whose coöperation with the manufacturer is both close and efficient.

"That is the reason why, in connection with a lot of accessories of the motor car, the Englishmen are really superior. The British motors do not give as much as ours, but they are mighty convenient. The extraordinary favor in which they are held here, the metal wheels and the valveless motors have no other origin. The valveless motor is no longer contested or spoken against. He was the knight yesterday but he is the king today. Yes, this country has a great people. Let us recognize this impartially."

REDLAND'S MILE-HIGH CLIMB

Los Angeles, Cal., Nov. 26—The second Mile-High hill-climb at Redlands Thanksgiving Day proved even more successful than the first and the thousands who gathered at the many points along the 15-mile course saw such speed as never before was made over the road. Former records fell with the completion of the run of the first car to start. The honors in the free-for-all, the big event of the day, went to Harris Hanshue and the Apperson Jackrabbit, which after breaking a wheel in a stock chassis event and being repaired climbed the grade in 22 minutes 7½ seconds. One of the surprises of the day was the little Maxwell, which fairly flew over the course and beat the time of every car entered but the Jackrabbit. Driven by Clarence Smith, this little car did the grade in 22:35 in the feature event. It easily won its class.

This event is nothing more or less than a combination road race and hill-climb. There are many level stretches and some ascents. The worst of the grade is at the last end, when the cars climb into the clouds amid the snow-capped peaks. Starting from the heart of the business section of Redlands it winds through the orange groves and gardens to the higher country around Casa Blanca. There is a drop into the canyon and then a steady pull up a winding road to the finish. Sixteen cars started this year. Three machines—Corbin, American Simplex and Apperson—met with mishaps, but fortunately no one was hurt.

The crowd was gathered all along the course, but the principal points of interest were the start, finish and at Casa Blanca, 10 miles from the start. The Apperson and Maxwell shared the honors in the dash to Casa Blanca. Both were around the 14-minute mark. Summaries:

231-300 CLASS

Car	Driver	Time.
Maxwell,	C. B. Smith	22 :46
Pullman,	George Kussman	25 :36
Cadillac,	C. McKeague	27 :03½
Corbin,	A. Livingston	*

301-450 CLASS

Buick,	J. Nikrent	24 :33
American Simplex,	H. Herrick	*

451-600 CLASS

Matheson,	P. Renton	24 :35
Apperson,	H. Hanshue	*

SPECIAL EVENT

Regal,	Anthony	31 :11
Ford,	R. Stearns	38 :35

FREE-FOR-ALL

Apperson,	H. Hanshue	22 :07½
Maxwell,	C. B. Smith	22 :35
Palmer-Singer,	F. Siefert	22 :55
Chadwick,	H. Kennedy	23 :03½
Matheson,	P. Renton	24 :35

* Accident; did not finish

DETROIT GETS GENERAL MOTORS' BIG PLANT

DETROIT, MICH., Nov. 27—The most important announcement in the history of the motor manufacturing industry in Detroit was made here on Wednesday when the local representatives of the General Motors Co. came to the common council of Detroit and stated the intention of the corporation to build here the largest factory in the world devoted to the making of parts. The co-operation of the council was requested for the closing of three streets which at present run through the property on which the new factory is to be built. The announcement was not made until the General Motors' representatives had secured 154 parcels of land, making up a plot of 50 acres, right in the heart of the local manufacturing district, negotiations for which had been in progress for nearly 2 months.

The site of the new factory, which will be known as the Central Detroit plant, is located in the Milwaukee Junction region and is bounded by the Grand Trunk tracks, Holbrook avenue, St. Aubin street and the imaginary prolongation of Denton avenue. On it the General Motors Co. will erect, beginning in April, a factory building to cost $2,500,000. The plant, according to W. C. Durant, will be a vast foundry and machine shop, in which will be made the bulk of the parts which are required for the various cars marketed by the corporation. The plans are already complete and call for fourteen buildings, most of them three stories high, and of the most recent factory construction. These will include an administration building, 90 by 296 feet; a central pavillion, 90 by 436 feet; a central machine building, 90 by 256 feet; a saw-tooth roofed one-story foundry, 206 by 256 feet; an assembling plant, 90 by 196 feet; two assembly plants, 90 by 700 feet; a warehouse, 296 by 290 feet; three wood shops, the largest 300 by 256 feet; a paint shop, 90 by 550 feet; a foundry, one story with monitor roof, 180 by 780 feet, and a one-story power house, 90 by 150 feet. The total floor space of the plant will be 100 acres, exclusive of the shipping sheds and other smaller buildings.

Convenient access is had to the tracks of the Grand Trunk, Michigan Central and Lake Shore railroads, and the plant is ideally situated for the purpose of securing labor, it being reached by three street car lines communicating with the populous east side residence district without change. when the factory is in operation it will employ between 6,000 and 7,000 hands.

In speaking of the General Motors' determination to build its plant in Detroit, W. C. Durant mentioned as causes the fact that the city has now the largest class of skilled mechanics available anywhere in the country and called attention to the ideal conditions prevailing here for securing the men to do the work.

As soon as the council formally grants the request to close Fordyce, Chandler and Andrus avenues within the limits of the plat on which the factory is to be constructed, work of removing the buildings now on the property will be commenced and the ground put in shape for the building operations. The cost of securing the real estate was over $300,000, it is stated authoritatively.

Closely following the announcement of the new General Motors factory came the statement that a firm of Pittsburgers has now a representation in the city endeavoring to enlist sufficient capital to build and equip a steel mill here at some point along the river front. The steel mill planned is to cost $1,200,000, of which the promoters are ready to put up $300,000, hoping to place the remainder of the stock in Detroit. At present the supply of steel used for Michigan's motor cars comes from Pittsburg very largely, in the form of sheets. Rolling of sheet steel would accordingly be the principal duty of the new mill. It is pointed out that virtually all the steel which Pittsburg mills turn out is freighted as ore past Detroit. The obvious saving possible is one of the strong arguments made in the effort to interest local capital. In case the present plans are brought to a successful issue, 600 hands would be brought here from the center of the steel industry.

Expansion of the manufacturing industry by the addition of new members to the trade continues the local feature. Among the new manufacturers of motor cars and parts recently organized are the American Auto Trimming Co., with a capital of $10,000; the Templeton Dubrie Car Co., $150,000; the Beyster Detroit Motor Co., $50,000; and the Detroit Magneto Co., $100,000.

Locally the field of promoting factories is becoming almost a craze. Reports from all the factories now in operation have it that more cars will be sold in 1910 than can possibly be made and the fact that some concerns with a product as yet untried have sold their entire output already adds strength to the enthusiasm. The older factories are all running at the very top speed. A few days ago it was formally announced at the Ford that there were orders on hand there for 19,500 cars.

PRINCE HENRY TOUR DETAILS

Berlin, Nov. 15—The Prince Henry tour in 1910 will be held June 2 to 8, starting from Berlin and ending in Homburg, in the Taunus district. There will be two speed trials, like this year, and in the way of a novelty it may be finally decided that there be no day of rest. This was the principal subject of discussion and decision at the annual meeting of the various German clubs belonging to the German Automobile Association, which took place 2 days ago. There were about sixty delegates, representing twenty-one clubs. It also was decided that the postponed small-car trials will be held some time in May and that the event will be open to the makers of all the world. The proposed reliability run of the Middle European Automobile Club, to be held in Thuringen in August or September, and which is to be an international contest, was given the official O. K. as far as the suggestion is concerned. Final permit will only be delivered after the Kaiserliche Automobile Club has seen and approved the rules and regulations to govern the event. The proposition of the Automobile Club of Alsace-Lorraine asking that the Kaiserliche Club urge the railroad state department to have warning signs or posts erected by it near all railroad crossings was adopted unanimously.

MEMPHIS SPEEDWAY PROBABLE

New Orleans, La., Nov. 26—Motor racing seems to have pleased the fancy of the southerner. New Orleans was perhaps the first city in the south to hold regular motor meets. Savannah then followed with its grand prize race and then Atlanta took the fore with its 2-mile track. The announcement has just been made that Memphis capitalists and enthusiasts are going to build a $200,000 2-mile speedway in that city. A large part of the sum already has been raised and incorporation papers will be issued soon. Pensacola, Fla., is the latest to get the craze, along with horse racing. Pensocola is to have horse racing and the motor enthusiasts in that city are dickering now with the horsemen for the erection of a combination motor speedway and horse track, so arranged as to give a mile circuit for the horses and twice that distance for the motor cars, with one grand stand serving both.

WOULD TAR FRENCH ROADS

Paris, Nov. 17—A proposition to tar all the leading roads of the department or state of Seine—in which Paris is located—has been laid before the general council of that state by Ambroise Rendu, a Paris representative at the council. In an interesting document Mr. Rendu shows the wonderful developments made by the motor industry during the last 10 years, its influence upon the country in general and Paris and its vicinity in particular, the benefits derived from it and also the inconveniences which it causes and among which is the important dust problem. According to the state records there were 624,312 square feet of tarred roads in the department in 1905; a year later there was a total of 1,388,556 square feet, in 1907 the total attained 2,755,584, and for

1908 the total was 3,875,040. The cost during the last-named year was $12,124, or an average expense of .03 per square meter. The proposition of Rendu has not yet been formally acted upon, but the motorists who know the advantages and joys of tarred roads are hoping that the authorities will give the matter favorable consideration.

LOUISIANA AROUSED

New Orleans, La., Nov. 27—The Motor League of Louisiana is planning a vigorous legal campaign for next May when the state legislature convenes. It will have representatives at the legislature in Baton Rouge to foster the good roads campaign for appropriations and also will look after the interests of the motorists in general in any legislation which may be introduced. It is likely that the league will foster some plan of state licensing of motor cars, the revenue of which will go towards the building of better roads. There is no state licensing or registering of cars now, each city having its own.

LOS ANGELES' SECOND MEET

Los Angeles, Cal., Nov. 24—The second meeting of the Los Angeles Motor Racing Association brought out two big crowds last Friday and Saturday. For hair-raising thrills no race meet held in Los Angeles has equaled this one. One car turned over twice on the track, another lost a wheel, a third was brought to an abrupt stop by a tire wrapping around the driving chain, another broke a steering knuckle on the track and still another left the track and leaped a 15-foot embankment. Fortunately no one was seriously injured. The racing proved interesting and held the crowd to the finish each day. The big event of the meet was the 150-mile race Sunday which brought out a field of six starters. The Isotta, which met with an accident Saturday, did not appear.

Two cars which met with accidents in the 50-mile race on the day previous appeared Sunday and ran away with the long contest. The Apperson Jackrabbit with Harris Hanshue at the wheel won by a margin of 14 miles over the Cadillac 30. The Jackrabbit had its usual tremendous speed and reeled off miles in 1:02 when it was making up lost time on the leaders. The performance of the Cadillac 30 was one of the features of the race. In the 50-mile race Saturday while being driven by Billy Carlson this car turned over twice on the far turn. At the half pole there was a deep rut and just before reaching this a nail went through the tire, causing the rim to skid into this hole and throwing the car around. It was going close to 60 miles an hour at the time and the momentum caused it to swerve and before it could be righted the speed carried it over twice. Carlson was cut about the head but not seriously hurt. The car appeared to be badly wrecked but under the direction of Lester Patee the car was righted and with a couple of new wheels was soon headed for town. The repair crew got busy at once and at noon Sunday the car was started for the track. C. McKeague, the Durocar driver, who had been engaged Sunday night to drive the car, never had driven a Cadillac before. He drove a heady race and took things easy when he saw he had second place cinched. At one time the Cadillac was the only car running on the track. Guy Irwin had a narrow escape when the Franklin tore through the fence and leaped a 15-foot embankment. The little Sunset was running in front in the long race when it broke a steering knuckle in the eightieth mile.

The Palmer-Singer won the 10-mile race in 10:47⅘. This is the fastest 10 miles ever seen here in competition. The Corbin was second. The Palmer-Singer also won the mile time trials in 1:04⅘. The track was slow at the time. Frank Siefert drove a grand race and handled his car in a clever manner.

The 50-mile race proved a surprise. Lou Denker had entered his Sunset for the sport of being in the game and the little car won handily with the Palmer-Singer second. The latter had tire trouble. The Franklin had a good chance and looked like a winner when a rear tire went out and the time lost in changing put it out of the running. The Sunset covered the 50 miles in 58:19⅕.

Passing Of Jacob's Ladder; Road Hazard Is Removed

Boston, Mass., Nov. 27—The action of the Massachusetts highway commission in accepting the new piece of highway in the Berkshire marks an epoch in road constructing in this country, for it places the Bay State in the position of being the first commonwealth to have one continuous state highway from line to line within its borders, and at the same time it wipes out forever the famous Jacob's ladder that many motorists knew to their sorrow. The legislature passed an appropriation of $50,000 2 years ago to build a road that would do away with the climb over Morey's hill, and the work has just been finished so now there is one continuous trunk line reaching from the Atlantic coast in the east to the New York state line on the west. How much this means to motorists thousands of them know, for the Glidden tourists had to climb Jacob's ladder on two occasions, and some of the cars had to be backed up over what was admitted to be the worst bit of road in the state. The hill had a grade that averaged 12 per cent but in some places it was 17 per cent. It was a long pull up over the top and time and again cars got stuck and horses had to be sent for to pull machines over the grade. Now, however, there is a splendid macadam highway extending around the hill and the maximum grade is only 6½ per cent. The new road has a 15-foot macadam surface all the way, and the roadway in its narrowest part is 21 feet wide. Much heavy foundation work was necessary in completing the road, and three reinforced concrete beam bridges had to be built. The new road makes the trip between Becket and Lee a little longer, but because of the fine road the distance can be made much more quickly. So now it is possible to start from Boston and motor through Worcester, Springfield and Pittsfield to the New York state line over one of the finest highways in the United States.

LEGISLATIVE SESSION CALLED

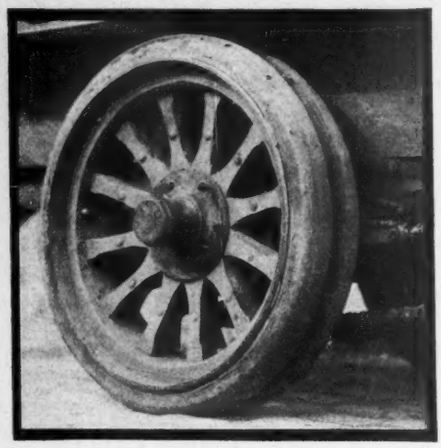
New York, Nov. 29—Charles Thaddeus Terry, chairman of the legislative board of the American Automobile Association, has announced after a conference with the association officers that the first national legislative convention, under the auspices of the A. A. A. will be held in Washington during the middle of January. This will be the first legislative convention of its kind ever held, although 2 years ago the legislative board of the A. A. A. combined with the good roads board in holding the first big convention at Buffalo, which was chiefly devoted to the good roads movement. Plans are now under way to invite the governors or their representatives from all the states in the country. The two chief matters that will be brought before the coming national convention will be the national registration motor law and the uniform state law. The national registration act will be reintroduced into congress by Congressman Cocks, who had charge of the bill last year, and it is proposed to secure a hearing upon the bill before the judiciary committee during the time of the convention in Washington.

SPEEDWAY MEET BOOKED

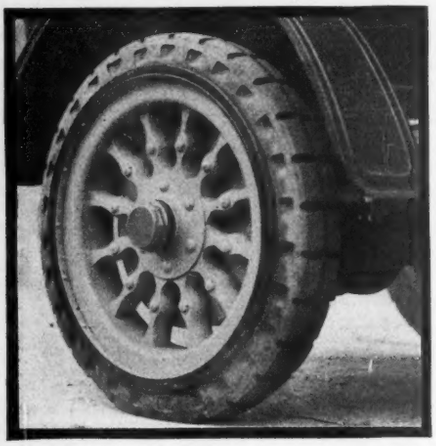
Indianapolis, Ind., Nov. 29—With the understanding that the brick pavement on the Indianapolis motor speedway will be completed by December 5, plans are under way for a race meet on the course on December 11. This meet is to be held in the hope of regaining the track records, now held by the Atlanta speedway. There are to be events for stock chassis of all classes under the rules of the A. A. A. These will include everything from 1-mile speed trials to a 1,000-mile match race. Suitable prizes will be offered and it is also understood that all money derived from the meet, above expenses, will be divided among the drivers establishing new records. In connection with the proposed meet, it is stated that Ernest A. Moross has withdrawn his resignation as director of contests. The resignation was to have become effective on November 15, but the management induced Mr. Moross to reconsider his action.

FRANCE MAKES EXHAUSTIVE TEST OF MOTOR

Thirty-One Machines Participate in Twenty-Four Distinct Journeys With Great Credit To Their Makers



CONTINENTALS OF DUAL TYPE USED IN FRENCH TRIALS



DUCASBLE TYPE OF SOLIDS USED ON SOME OF THE CARS

PARIS, Nov. 30—Thirty-one commercial motor cars of various types and powers have been put on the scales, verified, and dismissed with a diploma certifying that they have made twenty-four distinct daily journeys, covering a total distance varying from 1,500 to 2,300 miles, on schedule time; have carried a certain load and have used a certain amount of gasoline, alcohol, benzol and lubricating oil, in this year's French industrial vehicle trials, which were organized with more assistance from the army than is usual, for the government, after experimenting cautiously for a number of years, has decided to inaugurate a system of subsidies, under which the purchaser of an approved type of vehicle can receive $600 the first year and $200 for each of the 3 following years, on condition that he presents his car annually for inspection and hands it over in case of mobilization. The type to which these favors should be extended was to be decided upon during these trials.

Regularity of running and economy in the use of fuel were the basis on which the trials were held. They were more difficult than on any previous occasion, for, with a view to eliminating the weaklings, the army authorities insisted on the date being October 15 to November 15. It is a time of the year when roads are liable to be heavy, putting engines and transmissions to a more severe test than in summer.

At the start the competition united fifty-one vehicles. At the finish there were twenty-nine in the club and army test, with two others that had entered under army conditions only. Two steamers, which went through the preliminary formalities, were withdrawn on the first day owing to the impossibility of arriving at an understanding on the fuel question. Two gasoline-electrics were withdrawn after the first day's run, owing to their obvious inability to compete on an economical basis with the gasoline products. There were two or three cases of gear failure causing withdrawal, and several of engine breakdown. In four or five cases the mishaps were so slight that the competing vehicles were repaired and continued, though not given any official credit for doing so. Among these were two Berliet trucks, which, on the first day, ran into one another on a hill, owing to the brakes of the rearmost vehicle failing to hold. They were both repaired the same day and followed in the wake of the actual competitors, covering all the stages on schedule time. Officially, however, they were ignored.

The firms which figured best for team work were Saurer, with five starts and five finishers in different classes, several of these being first prize winners. Delahaye with four starters and finishers; Bayard-Clement, also with four to start and finish; Aries with the same number, and Vinot-Deguingand with three out of three. De Dion-Bouton lost two out of its four vehicles during the month; Peugeot lost two out of four, one of the two, however, continuing unofficially. Berliet also lost two out of four, the disqualified pair continuing without official recognition. Panhard-Levassor lost three out of four of its 15-horsepower trucks; Malicet & Blin had one failure out of three entrants, and Schneider lost its pair.

Reliability Test Severe

The reliability test was much more severe than is usual in competitions held by the French club. With the exception of the heaviest vehicles, the average speed was fixed at 15 miles an hour, for daily runs varying from 60 to 120 miles. A maximum speed also was imposed, it being the duty of the military observer to see that it was not exceeded on any stage of the journey. If it were exceeded, the vehicle had to be held back until the time limit had expired. Failure to make any one control on time meant disqualification.

Three different types of fuel had to be used. For the first 13 days ordinary gaso-

VINOT-DEGUINGAND AND DE DIETRICH ON ROAD NEAR SARCELLES

COMMERCIAL WAGONS FOR MILITARY USES

Careful Account Kept of Regularity of Running and Economy In the Use of Gasoline, Alcohol and Benzol

line was supplied, and for the 3 days over different routes the consumption was officially controlled. For 1 week the vehicles had to use alcohol, with 2 of these days during which the consumption was noted. Finally benzol was imposed for 5 days, with 2 of them under official control as regards consumption. As a proof of the thorough manner in which the fuel problem has been studied, it is necessary only to state that there was not a single failure to successfully use alcohol and benzol, with no other adjustments than were possible during running time. Naturally, they were prepared for this, there being a number of interesting carbureter adjustments with a view to economy, but the engines themselves had to remain unchanged. The only difficulty experienced was in starting up when the engines were cold.

Fuel economy was not quite so remarkable as during last year's test, the reason being the increased average speed imposed. Another point of interest in the trials was that, instead of the economy test being held at the end of the run over a comparatively short distance, it was carried on on 7 different days and for a distance of roughly 500 miles. Another innovation was that the consumption of lubricating oil was controlled from the commencement to the end of the run, that is to say, for a period of 24 days and over a distance of more than 2,000 miles.

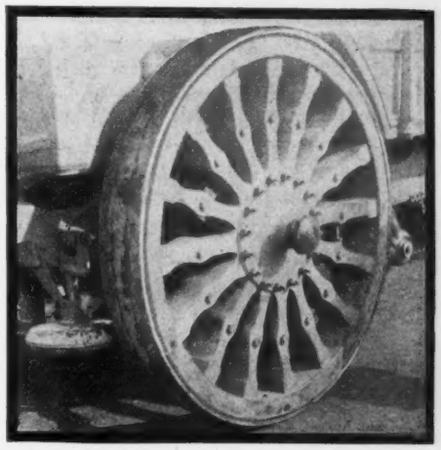
Horsepower Kept Low

With a view to figuring well on the economy basis the horsepower of the engines was kept as low as possible. In the class carrying loads not exceeding 3 tons, the rating of the engines varied from 14 to 22. Notable in this class were two Delahaye trucks, with two-cylinder engines rated at 15 horsepower and having a bore of 3.9 inches and a stroke of 7.08 inches. Long-stroke motors were in the majority, and further showed their superiority over the short strokes by winning in nearly all the classes. In section 5, for vehicles carrying more than a 3-ton load, two Delahaye trucks with four-cylinder engines of 3½ by 6⅕ inches bore and stroke, won respectiveliy first and second prizes. On the official trials, the two-cylinder Delahaye, carrying a useful load of almost 3 tons, would cover 12 miles to a gallon of gasoline. The four-cylinder of the same make averaged 10½ miles to the gallon, with a load of 3½ tons and a total weight of 6 tons.

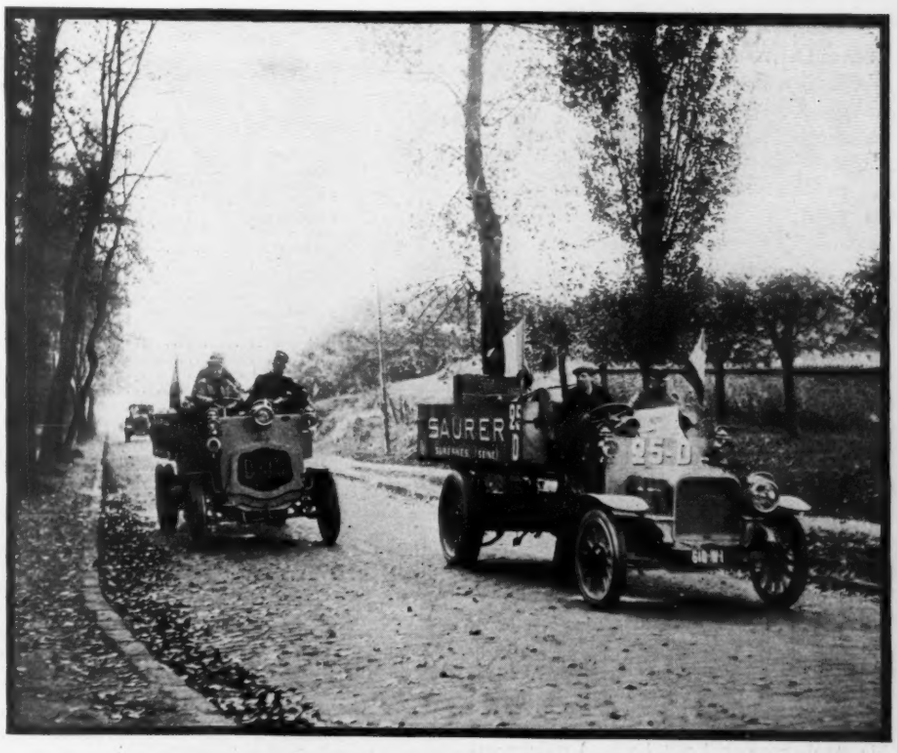
The competing vehicles were divided into eight distinct classes, the first one being occupied entirely by a small two-cylinder Clement-Bayard delivery van, which naturally won first prize. The second section, for delivery vans carrying a useful load varying from 1,324 to 2,645 pounds, was entered by de Dion-Bouton and Vinot-Deguingand. The de Dion-Bouton, a one-cylinder of 9 horsepower, broke down during the trials, leaving the four-cylinder Vinot-Deguingand the victor. In the third section there were only three entries, all of which went through to the end, Saurer getting first prize, Clement-Bayard second and Delaugere-Clayette third.

There was keen competition in the fourth class, where loads of 4,400 to 6,600 pounds were imposed. Here Saurer got first and third prizes, the two-cylinder Delahaye second and fifth, and Vinot-Deguingand fourth and sixth. The others in order were de Dion-Bouton, Aries, Panhard, Malicet & Blin, and Cohandet. The fifth section, imposing loads of more than 3 tons, was with the fourth, one in which the army was interested, and drew forth a strong set of competitors. Delahaye took first and second prizes, de Dion-Bouton third and fourth, Aries fifth and sixth, and Malicet & Blin seventh. Whereas in the fourth class solid rubber tires had been carried almost without an exception, in the fifth section, having loads running as high as 5 tons, there were several cases of steel-shod bandages all round and more in which rubber was used in front only.

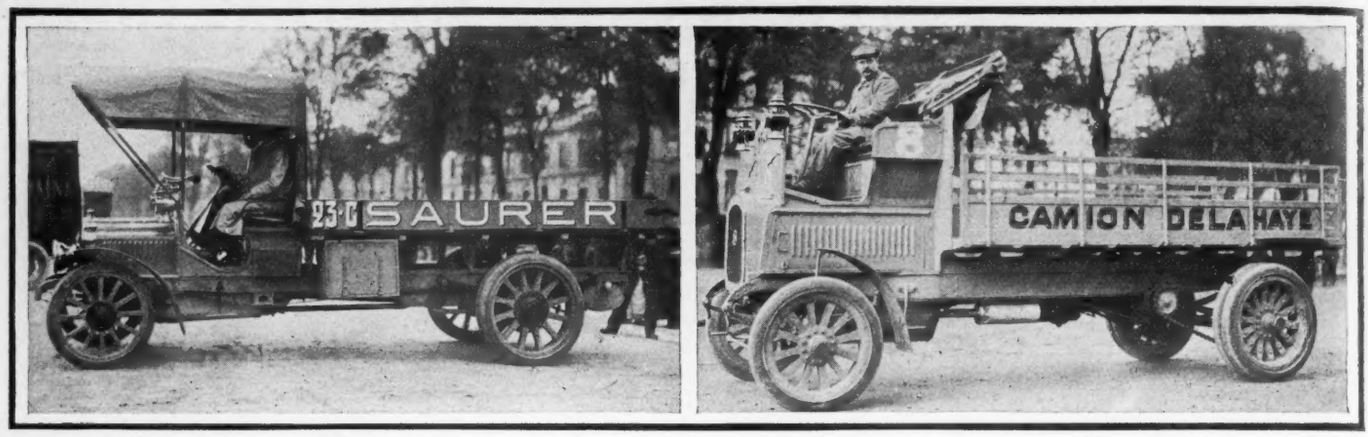
MICHELIN TIRES AS USED IN INDUSTRIAL TRIALS



KRIEGER TYPE TESTED OUT BY THE FRENCH EXPERTS



TRUCKS ON THE ROAD NEAR DEAUMONT, SAURER LEADING



SAURER TRUCK, SECOND IN ITS CLASS

ONE OF THE DELAHAYES IN CLASS 5

The road trains and omnibus classes were not well filled. Saurer was the only one in the tractor class, his tractor having a load of 4 tons and his trailer one of 3 tons, pulled by an engine of only 4 by 6 inches stroke. The small bus class, having seats for six to eight persons, was won by Clement-Bayard, with the same firm second and Peugeot third. Saurer was the only entrant in the large bus class, and, having fulfilled all requirements, was declared the winner.

Military Men Suspicious

The military section of the jury was more than usually afraid of cheating. When the competition had been brought to a close and final weighing in carried through, this operation, comprising four separate weighings, with load, without load, with body and without body, the mechanical organs were tested. Every gasoline tank was opened.

SAVANNAH TALKS ROAD RACE

Savannah, Ga., Nov. 30—If present negotiations mean anything there is a fine chance for Savannah to hold another grand prize race next year. For the past 2 weeks the Savannah Automobile Club and the Automobile Club of America and the A. A. A. have been exchanging correspondence on this subject. There is only one thing that is preventing the grand prize race and that is that the foreign manufacturers have not yet agreed to enter any more of these kind of races. The American manufacturers are now ready to take part in it if arranged and all that is left is to get the foreigners to come in. If the present plans hold good and the international event takes place then another stock car event also will be held, something like the light car race which was held just before the last grand prize contest. The stock car race which was held here in March, 1908, and which was won by the Isotta, and for which the cup was to be raced for three times, will be put on again. At present the cup is in the hands of the Automobile Club of America. This stock race will not be held unless another grand prize contest takes place.

Brussels' Fair Attracts Attention

BRUSSELS, Nov. 12—It may not be too late for American motor manufacturers to secure space in the American section at the big world's fair which will be held in the Belgian capital from April to November, 1910. At present it seems that no United States concerns are listed as exhibitors. At least that is what some assistant of the executive staff says. On the other hand, France, Germany, Italy and other continental motor car producing companies have taken great interest in the fair and will be largely represented.

The French motor car section will be the most important one, next to the Belgian. Like for all countries the motor car and parts exhibits will be located in the general French section or hall and will occupy not less than 4,000 square meters of space. Up to 3 weeks ago nearly fifty among the leading concerns of France had secured space. Among them are Renault, Panhard, de Dietrich, Delahaye, Gregoire, de Dion-Bouton, Mors, Niclausse, Peugeot, Michelin, Bergougnan, Longuemare, Aster and Nilmelior. Those manufacturers who are also engaged in the construction of flying machines or in motors for aeronautical work will show them on their motor car stands.

RESULTS OF THE FUEL TESTS—GASOLINE, ALCOHOL

Order of Finish	Car	Class	Car weight in pounds	Load in pounds	Total weight in pounds	Distance in miles	Pints of gasoline	Time H M S
1	Delahaye	5	6564	8000	14465	171	177.1	15:19:02
2	Delahaye	5	6593	8900	14493	.....	171.9	15:22:00
5	Aries	5	6505	6853	13358	.....	228	17:21:15
6	Aries	5	6398	6829	13222	.....	240	17:32:46
4	de Dion-Bouton	5	6534	6483	13017	.....	213.5	15:20:45
3	de Dion-Bouton	5	6578	6485	13063	.....	206.5	16:07:00
7	Malicet et Blin	5	6600	6437	13037	.....	352.5	20:36:00
1	Saurer IV-with trailer	6	7267	8984	16252	.....	359	20:27:15
5	Delahaye	4	4393	4939	9332	210	156.7	17:32:29
2	Delahaye	4	4417	4944	9361	.....	150	18:39:36
8	Aries	4	5304	4853	10157	.....	206	17:49:07
..	Aries	4	5269	4820	10089	.....	195	17:38:39
..	Schneider							
7	de Dion-Bouton	4	6595	5505	12100	.....	260	18:12:47
..	de Dion-Bouton	4	6598	5587	12185	.....	269	18:49:16
3	Saurer	4	6586	5978	12564	.....	224	15:45:12
1	Saurer	4	6600	6032	12632	.....	211.6	15:08:00
..	Delanger-Clayette	4						
4	Vinot-Deguingand	4	6351	6589	12940	.....	220.6	16:28 30
6	Vinot-Deguingand	4	6283	6700	12983	.....	230.7	16:40:58
..	Peugeot	4	6538	6360	12898	.....	255	13:35:28
10	Peugeot	4	6562	6378	12940	.....	265.1	20:52:15
9	Panhard-Levassor	4	6534	5702	12236	.....	230	21:29:09
..	Panhard-Lavassor	4	6454	5727	12181	.....	239	23:49:18
..	Panhard-Lavassor	4						
12	Cohendet	4	6593	6211	12804	.....	369.6	26:08:00
..	Cohendet	4	6578	6089	12667	.....	412.4	25:52:25
11	Malicet et Blin	4	10133	7803	17936	.....	263.7	21:20:30
..	Bayard A. Clement	1	2046	1166	3212	276	105.3	17:36:00
..	de Dion-Bouton	2						
1	Vinot-Deguingand	2	3484	2108	5592	.....	155.7	20:40:20
1	Saurer	3	5104	4459	9563	.....	226	21:12:10
3	Delangere-Clayette	3	3975	2640	6615	.....	293	24:58:00
2	Bayard A. Clement	3	4149	3122	7271	.....	201.4	24:53:25
3	Peugeot	9	3911	1765	5676	.....	165.6	22:57:00
..	Peugeot	9						
2	Bayard A. Clemet	9	2567	772	3339	.....	106	18:34:30
1	Bayard A. Clement	9	3300	1232	4532	.....	132.8	18:47:00
1	Saurer	10	7660	4545	12205	.....	271.4	18:21:40

VINOT-DEGUINGAND FITTED WITH A CLOSED BODY

CLEMENT'S IDEA IN THE FRENCH TRIALS

Belgians Will Show Own Makes

BRUSSELS, Nov. 15—The ninth annual Belgian motor car show, which will be held in this city during the second fortnight of next January, promises to be the first exhibition in this land at which the majority of exhibitors, or rather of cars shown, will be of Belgian construction. Heretofore, almost from the time the first Belgian show was held, there were two or three and sometimes even four foreign cars shown for every Belgian car. This coming show will probably be just the reverse. The list of exhibitors shows eighteen Belgians, five French, one German, one Italian and one American. The Belgian cars to be shown are the Pipe, F. N., Metallurgique, Minerva, Miesse, Dasse, Excelsior, Springuel, Nagant, Fondu, Germain, Belgica, Vivinius, Piedboeuf, Imperia, Auto-Mixte, Energique and Deconinck. From France there will come the Berliet, de Dion-Bouton, Sizaire-Naudin, Mors and Rochet-Schneider. Italy will be represented by the Itala, Germany by the Mercedes and the United States by the Mitchell. When compared with last year's number of car exhibitors the present record is smaller by more than a dozen. It seems strange, especially as it was the opinion of members of the show committee that France would be specially well represented, but it appears that for several months past the agents for the leading French cars in Belgium have been opposing the show. They hold that there is no need for one, complain that space is too costly and that they did not like the idea of the uniform decoration scheme. That the anti-show movement has been successful is shown by the fact that Renault, Panhard, Lorraine-Dietrich, Peugeot, Brasier, Clement, Darracq, Delahaye, Alcyon, Gregoire and a few others which were on the list in former years most likely will be absentees. Neither Italy nor Germany ever had a big representation at the Belgian show, although Fiat, Benz and N. A. G. usually were there with large and handsome displays.

AND BENZOL—IN THE FRENCH INDUSTRIAL TESTS

Ton mileage per gallon	Pints of alcohol distance 193 miles	Time H. M. S.	Ton mil'age per gallon	Pints of benzol distance 193 miles	Ton mileage per gallon	Tires	Ignition
30.6	108	10:24.00	57.1	105.6	58.4	Bergougnan solid	Bosch
31.8	105.5	10:29.00	57	102.6	60.2	Bergougnan solid	Bosch
22.5	129.1	12:05.00	44.9	111	52.3	Bergougnan solid	Nilmelior
21.3	143.6	12:03.00	40.3	123.6	46.8	Bergougnan solid	Nilmelior
22.4	170	10:58.00	31.8	140	38.5	Bergougnan solid	Nilmelior
23.2	153.1	10:28.00	35.3	147	31.4	Bergougnan solid	Nilmelior
15.	246	15:18.00	20.2	195.3	25.2	Bergougnan	Bosch
17.	237.3	12:03.00	29.3	217.5	30.9	Continental solid	
26.7	117.2	10:40.00	33	88.3	43.8	B. S. Torrilhon	
28.	108.7	10:37.00	35.4	93.4	41.5	B. S. Torrilhon	
20.4	144	13:18.00	26.7	120	32.1	Bergougnan solid	Nilmelior
21.6	131.1	11:37.00	29.3	112	34.4	Bergouguan solid	Nilmelior
						B. S. Torrilhon	Nilmelior
17.7	171.1	11:15.00	24.7	137.6	30.8	B. S. Torrilhon	Nilmelior
17.						Continental solid	
22.5	167.6	11:03.00	27.6	143.8	32.3	Continental solid	
23.8	173.8	11:56.00	26.6	131.1	35.2	Continental solid	Bosch
						Continental solid	Bosch
25.2	184.6	10:05 00	27.6	144.4	35.3	Bergougnan	Bosch
28.5	179.6	9:06.00	32.2	140.3	41.2	Bergougnan solid	Bosch
20 8						Continental solid	Nilmelior
20.	197.7	15:07.00	24.4	169.3	28.7	Continental solid	Nilmelior
20.1	180	13:03.00	23.5	151.	28.2		
10.5							
14.	297.7	17:19.00	16	231.4	20.6	Bergougnan	Bosch
12.2						Michelin	Bosch
25.8	232.5	13:07.00	26.6	155.7	39.7	Contin'tal precision on front wheels	Bosch
1.65	65.4	13:34.00	11.7	55.8	13.7	Continental double rear	Bosch
						Continental solid	
1.42	117.5	14:39.00	13.1	108.3	14.3	Michelin	Bosch
22.	160	12:39.00	21.6	186.6	19.	Michelin	Bosch
.93	238	16:37.00	8.1	236.4	81.	Michelin on front wheels	Bosch
12.5	134.4	16:23.00	14.2	122.4	15.	B. S. Torrilhon on rear wheels	Bosch
10.1	118.2	15:45.00	9.8	100.8	11.4		
7.4	80.2	12:50.00	6.7	69.7	77.	Michelin	Bosch
10.	97.6	12:58.00	9.4	79.4	11.5	Michelin	Bosch
18.3	206	13:05.00	16.8	198.2	17.1	Continental solid	

DE DION IN GRAND PRIX

Paris, Nov. 17—Entries Nos. 7, 8 and 9 have been duly made for the grand prix—three de Dion-Bouton cars. The only other cars that seem sure to be entered within a day or so are three Fiats and three Horches. So slow are the manufacturers that there is talk of cutting down the minimum of required entries to thirty instead of forty-five. The municipality of Dieppe, near which town the club's race was held 2 years ago, has offered a subsidy of $50,000, besides being willing to assume the expense of putting the course in perfect condition. Several leading ing sportsmen think that under the circumstances the club would not have to spend a big sum and therefore could certainly promote the race even if there are but thirty entrants. It is up to the sports committee, which, however, has not given any indication as to what it intends to do.

ENTER FRENCH RELIABILITY

Paris, Nov. 17—Entries for the reliability trials of l'Auto are coming in faster than for the grand prix. During the last few days four more cars have been entered, bringing the total up to date to twenty-seven. The new ones are three Alcyons and one Zenith. Two more of the latter may yet be entered, according to the manufacturers.

YEAR PROLIFIC OF GREAT MOTORING FEATS

RECORD-BREAKING events of more than usual interest are crowded into the motoring history of 1909 and America has done itself proud in this department. It is true no world's records have been smashed in the United States, but there has been a general shaking up on this side of the ocean that has advanced the prominence of this country in the motoring world. Two speedways have been constructed and put into successful operation, and while Brooklands in England has a speed table far in advance of either Atlanta or Indianapolis, yet the performances of the cars on the American ovals have been such as to encourage the makers. America has been singularly active in a road-racing way and has run twenty-seven of these contests as against only eight in Europe. In this line the sensation of the year was the mad dash of Chevrolet in the Buick in his class at Riverhead when he went 113¾ miles at the rate of 69.6 miles an hour, easily the best of any race on either side of the Atlantic.

In general there has been a marked increase in speed in road racing, although the record of 74.3 miles an hour by Nazarro in the 1908 Florio cup race still stands unequaled and probably will retain its place at the head of the column for several years at least because of the fact that the European makers decry road racing. Their frown means a discontinuance of events in which road locomotives can compete, while in America the makers now are firmly convinced that stock car racing is the only thing. Then, again, such a course as the one at Brescia is hard to find.

Mile-a-minute road races are not as rare as one would think, for a review of motor history shows that in twenty-four highway contests the winners averaged 60 miles an hour or better. This year nine of the twenty-seven events were in this category, last year there were six and in 1907 four. In 1906 and 1905 there were two each and as far back as 1904 there was one race which developed a mile-a-minute pace. The starter was the James Gordon Bennett international cup race, which was run over the Taunus course in Germany and which was won by Thery in a Brasier. Probably the most sensational of these speed flights was the first French grand prix, which was a 2-day event of a total distance of 774 miles. The cars ran 387 miles a day and were garaged over night under the eye of the Automobile Club of France. Probably the most brilliant field that ever lined up in an international event contested in this, and the winner was Francois Szisz in a Renault, who maintained an average of 63.3 miles an hour for the 774 miles. The most consistent performances have been made in the Florio cup race in Italy, which, however, was not run this year. The history of this classic shows that in its first running, in 1905, Raggio in an Itala went 313 miles at 65.6 miles an hour. There was no race

AMERICAN AND EUROPEAN MILE-A-MINUTE ROAD RACES

M. P. H.	Dis.	Race	Winner	Date
74.3	328.2	Florio cup, Italy	Nazzaro, Fiat	1908
70.61	478	Grand Prix, France	Nazzaro, Fiat	1907
69.6	113.7	Riverhead, U. S. A.	Chevrolet, Buick	1909
69.5	478	Grand Prix, France	Lautenschlager, Mercedes	1908
65.7	148.2	Portola, U. S. A.	Fleming, Pope-Hartford	1909
65.6	304	Florio cup, Italy	Minoia, Isotta	1907
65.5	313	Florio cup, Italy	Raggio, Itala	1905
65.4	208.8	Normandie, France	Boillot, Lion-Peugeot	1909
65.3	304	Florio cup, Italy	Cagno, Itala	1907
65.3	262.5	Targa Bologna, Italy	Porporato, Berliet	1908
65.1	258.6	Savannah Grand Prix, U. S. A.	Wagner, Fiat	1908
64.4	202	Los Angeles, U. S. A.	Hanshue, Apperson	1909
64.3	258.6	Vanderbilt, U. S. A.	Robertson, Locomobile	1908
64.2	234.6	Motor Parkway, U. S. A.	Lytle, Isotta	1908
63.7	254.1	Portola, U. S. A.	Fleming, Pope-Hartford	1909
63.6	136.5	Riverhead, U. S. A.	Sharp, Sharp-Arrow	1909
63.3	774	Grand Prix, France	Szisz, Renault	1906
62.8	278	Vanderbilt, U. S. A.	Grant, Alco	1909
62.4	211	Portola, U. S. A.	Hanshue, Apperson	1909
62.4	227.5	Riverhead, U. S. A.	De Palma, Fiat	1909
61.4	283	Vanderbilt, U. S. A.	Hemery, Darracq	1905
60.8	297.1	Vanderbilt, U. S. A.	Wagner, Darracq	1906
60.3	340	Bennett cup, Germany	Thery, Brasier	1904
60.1	375	Ardennes, Belgium	Guinness, Minerva	1907

English Beach Records

The English beach record stands at 120.26 miles per hour over a 1-kilometer course, made on the Saltburn beach by A. Guinness, driving a 200,-horsepower eight-cylinder Darracq, in 1909. It will be seen by this that the English beach is not as fast as the one at Ormond, Fla.

Gasoline Economy Record

The record for fuel economy as demonstrated in an official test was made at Buffalo, N. Y., July 8, 1909, when an 18-horsepower four-cylinder Franklin touring car driven by Averell, traveled 46.1 miles on 1 gallon of gasoline. The car with passengers weighed 2,948 pounds.

American Road Records

Straightaway 1-mile road trials were run at Lowell, Mass., September 7, 1909, and stand as record, for these trials are the first and only ones run so far under the classification by piston displacement and price drawn up by the Manufacturers' Contest Association and adopted by the American Automobile Association, which has hall-marked them as official. Faster time has been made in other straightaway road events, but the accuracy of the trials has not been vouched for by the governing body of motoring. The records:

Free-for-all, flying start—Barney Oldfield, Benz; time, :39.9.

Free-for-all, standing start—Barney Oldfield, Benz; time, :51.2.

Stock chassis, 451 to 600 cubic inches, standing start—Chevrolet, Buick; time, 1:01.6.

Stock chassis, 301 to 450 cubic inches, standing start—Chevrolet, Buick; time, :59.5.

Stock chassis, 231 to 300 cubic inches, standing start—Chevrolet, Buick; time, 1:03.

Stock chassis, 161 to 230 cubic inches, standing start—Burman, Buick; time, 1:07.7.

Stock chassis, $4,001 and over, rolling start—Lytle, Apperson; time, :52.8.

Stock chassis, $4,001 and over, standing start—Lytle, Apperson; time, 1:02.7.

Stock chassis, $2,001 to $3,000, flying start Willadsen, Matheson six; time, 1:02.2.

Stock cars, $1,251 to $2,000, flying start—Lynch, Jackson; time, 1:03.8.

TABULATED HISTORY OF TWO AMERICAN ROAD RACES

THE VANDERBILT CUP RACE

Year	Distance	No. Starters	No. Finishers	Winner	Time	M.P.H.
1904	284.4	18	2	Heath, Panhard, France	5:26:45	52.2
1905	283	20	4	Hemery, Darracq, France	4:38:08	61.4
1906	297.1	18	5	Wagner, Darracq, France	4:50:10	60:8
1907	No race					
1908	258.6	19	2	Robertson, Locomobile, U.S.A.	4:00:48	64.3
1909	278.08	15	2	Grant, Alco, U.S.A.	4:25:42	62.8

The original Vanderbilt rules provided that the competition for the trophy should not be less than 250 nor more than 300 miles and on a recognized regular highway or motor speedway; and that no car should be allowed to compete the weight of which exceeded 2,204 pounds or less than 880 pounds. Each country was allowed to nominate a team of five cars. In 1909 the Vanderbilt became a national instead of an international event, and was for stock chassis only, the A. A. A. classification being used, the two classes eligible for the Vanderbilt being from 301 to 450 and from 450 to 600 cubic inches piston displacement. The minimum weight of the 301-450 division was 2,100 pounds and the 451-600 2,400 pounds.

ROAD RACING AT SAVANNAH, GA.

Race	Distance	No. Starters	No. Finishers	Winner	Time	M. P. H.
Grand Prix	402	20	9	Wagner, Fiat	6:10:31	65.11
Light Car	196	15	7	Hilliard, Lancia	3:43:39	52.6
*Savannah Cup	342	8	5	Strang, Isotta	6:21:30	53.7
*Six-Cylinder	180	2	1	Salzman, Thomas	3:02:25	60.0
*Runabout	180	3	2	Lytle, Apperson	3:35:41	50.0

*Spring races in 1908; other two fall of same year

in 1906, but in 1907 there were two divisions, one run under Emperor's cup rules and the other under grand prix regulations. In the former Minoia in an Isotta showed 65.3 and in the latter Cagno in an Itala did 65.6. Then came the 1908 event in which Nazzaro created his world's record of 74.3 miles per hour.

Counting the spoils of 1909 shows that in addition to Chevrolet's road-racing mark America reports a new set of mile straightaway records, a speedway record table, a 24-hour competition mark, two records at Ormond, a gasoline economy mark, a wiping out of all the circular track records and a transcontinental race. England reports a new set of short distance world's records. To the Lozier belongs the credit of putting up sensational figures in the journey twice around the clock, the astonishing total of 1,196 miles being made by Mulford and Patschke.

The straightaway records established at Lowell, Mass., are not as fast as others that have been made, but they are the first ones accepted by the American Automobile Association and also the first run under the classification scheme now in vogue. Undoubtedly the year 1910 will see other attacks upon the straightaway marks, for such trials are not without interest from the spectator's point of view.

Ormond was not the racing success it has been in the past, but yet there were a couple of extra good performances noted, both of them made by the amateur, David Bruce Brown, who drove the big Benz which now is in the possession of Oldfield.

Twenty-Four Hour Records

The world's 24-hour record stands at 1,581 miles 1,310 yards, an average speed of 65.9 miles per hour. It was made by S. F. Edge in a six-cylinder Napier on the Brooklands track in England, June 28-29, 1907. It was a time trial. The American 24-hour record, made in competition, stands at 1,196 miles, made October 15-16, 1909, on the Brighton Beach track, New York, by R. Mulford and C. Patschke in a Lozier six-cylinder.

DETAILS OF EDGE'S RECORD DRIVE

Hour	Total Distance Miles	Yds.	Hour	Total Distance Miles	Record
1	70	130	13	866	330
2	140	1,320	14	938	480
3	207	800	15	1,006	1,640
4	271	1,160	16	1,068	400
5	342	1,350	17	1,139	1,100
6	407	60	18	1,203	830
7	474	360	19	1,263	1,170
8	537	1,210	20	1,327	1,190
9	609	720	21	1,390	1,100
10	670	1,200	22	1,458	130
11	737	480	23	1,519	360
12	799	1,600	24	1,581	1,310

Average speed per hour, 65 yards, 1,594 yards

DETAILS OF LOZIER'S 24-HOUR RACE

1	48	55*	13	652	658*
2	103	107*	14	703	710*
3	152	155*	15	752	761*
4	207	211*	16	802	810*
5	257	265*	17	853	857*
6	309*	....	18	904*	....
7	353	356*	19	951*	....
8	403	408*	20	1,001*	....
9	454	455*	21	1,050*	....
10	507	508*	22	1,096*	....
11	560*	....	23	1,145*	....
12	612	613*	24	1,196*	....

*Twenty-four-hour competition records

TABULAR HISTORY OF EUROPEAN ROAD RACES

EMPEROR'S CUP ROAD RACE, GERMANY

Only one race for the Emperor's cup was run, the contest being held June 13-14, 1907, over the Taunus course, in Germany, the distance being 300 miles. There were ninety-two entries, which made it necessary to divide the field into two divisions, leaving forty cars in the final. Twenty finished, the winner being Nazzaro in a Fiat, in 5:34:26, an average of 53.8 miles per hour. Special rules were made for this race, as follows: Cylinder capacity, 8 liters, maximum; weight of vehicle inclusive of carriage-work, 1,175 kilograms; minimum height of seats, 25 centimeters; minimum clearance, 15 centimeters; reverse gear obligatory.

GORDON BENNETT CUP RACE

Year	Dis.	No. Starters	No. Finishers	Winner	Time	M. P. H.
1900	351	9	2	Charron, Panhard, France..	9:09:00	38.1
1901	327	3	1	Girardot, Panhard, France..	8:54:59	36.6
1902	383	4	1	Edge, Napier, England.....	11:02:54	35.4
1903	386	12	5	Jenatzy, Mercedes, Ger.....	6.39:00	58.4
1904	352	18	12	Thery, Brasier, France.....	5:50:03	60.3
1905	340	18	12	Thery, Brasier, France.....	7:02:42	47.5

The James Gordon Bennett cup was presented for an international speed contest, it being required that all competing cars be built in the country from which they were entered, no country being permitted to enter more than three cars in each race.

THE FRENCH GRAND PRIX

Year	Dis.	No. Starters	No. Finishers	Winner	Time	M. P. H.
1906	774*	29	11	Szisz, Renault, France.	12:14:05	63.35
1907	478.3	38	16	Nazzaro, Fiat, Italy....	6:45:33	70.61
1908	478	49	23	Lautenschlager, Mercedes, Germany.....	6:55:43⅗	69.5

1909 No race

*Two-day race, 387 miles per day

The first two road races were run under rules which provided for a maximum cylinder bore of 5.51 inches and with no limitation as to the bore. The minimum weight was 1,100 kilos. In 1908 the rules were amended by the international committee of the Association of Recognized Automobile Manufacturers, which made the minimum weight 900 kilograms, or 1,984 pounds, and the maximum cylinder bore 130 millimeters, or 5.118 inches.

SICILY'S TARGA FLORIO

Year	Distance	No. Starters	No. Finishers	Winner	Time	M.P.H.
1906	281	10	6	Cagno, Itala	9:22:20	29.9
1907	276	45	28	Nazzaro, Fiat	8:17:36	33.2
1908	277	11	..	Trucco, Isotta	7:49:25	35.5
1909	93	11	7	Ciuppa, S. P. A.....	2:43:19	34.2

ITALY'S FLORIO CUP RACE

Year	Dis.	No. Starters	No. Finishers	Winner	Time	M. P. H.
1905	313	21	16	Raggio, Itala	4:46:47	65.5
1906	No race					
1907*	304	34	11	Minoia, Isotta	4:39:54	65.3
1907†	304	14	6	Cagno, Itala	4:37:36	65.6
1908	328.2	17	6	Nazzaro, Fiat	4:25:21	74.3

1909 No race

*Emperor's cup rules †Grand prix rules

New York-Paris Race

The New York-Paris race started from New York February 12, 1908, the field including a Thomas Flyer, representing America; de Dion, Motobloc and Sizaire-Naudin, France; Zust, Italy, and Protos, Germany. The race was won by the Thomas Flyer, which reached Paris in 169 days 2 hours, the distance being estimated at 20,000 miles. The Protos reached Paris 4 days ahead of the Thomas, but its claim was not allowed because of the car having been shipped by freight to Seattle.

New York-Seattle Race

The New York-Seattle race, run in June, 1909, in connection with the Alaska-Yukon-Pacific exposition, attracted thirteen entries, but only six cars started—two Fords, a Shawmut, Itala, Acme and Stearns. Ford No. 2 was the first car to finish at Seattle, having made the trip in 22 days 55 hours. Later, however, the Ford was disqualified on the charge of having changed an engine on the journey and the Guggenheim trophy awarded to the Shawmut, which had finished second to the No. 2 Ford.

AMERICAN CIRCULAR TRACK AND BEACH MARKS

STRAIGHTAWAY BEACH RECORDS MADE AT ORMOND, FLA.

Dis.	Time	M. P. H.	Holder	Time
1 kilo, steam	:18⅖	122.3	Marriott, Stanley	1906
1 kilo, gasoline	:19⅖	111.0	Chevrolet, Darracq	1906
1 mile, steam	:28⅕	127.66	Marriott, Stanley	1906
1 mile, gasoline	:30⅗	117.64	Chevrolet, Darracq	1906
1 mile, amateur	:33	109.9	Brown, Benz	1909
2 miles, gas	:58⅖	123.28	Demogeot, Darracq	1906
5 miles, gas	2:34	116.8	Hemery, Darracq	1906
10 miles, gas	5:14⅖	113.2	Brown, Benz	1909
50 miles, gas	38:51	77.25	Fletcher, De Dietrich	1905
100 miles, gas	1:12:56 1/6	82.26	Bernin, Renault	1908
250 miles, gas	3:16:48⅖	76.27	Cedrino, Fiat Cyclone	1908

AMERICAN 1-MILE CIRCULAR TRACK RECORDS

Dis.	Time	M. P. H.	Driver and Car	Place	Time
1*	:50⅘	70.86	De Palma, Fiat Cyclone,	Minneapolis, Minn.,	1909
5	4:26	65.21	De Palma, Fiat Cyclone,	Grand Rapids, Mich.,	1908
10	8:49⅗	67.9	De Palma, Fiat Cyclone,	Minneapolis, Minn.,	1909
15	13:57	64.4	De Palma, Fiat Cyclone,	Grand Rapids, Mich.,	1909
20	18:30⅘	64.5	De Palma, Fiat Cyclone,	Grand Rapids, Mich.,	1909
25	22:59⅗	65.2	De Palma, Fiat Cyclone,	Grand Rapids, Mich.,	1909
50	48:40⅕	61.64	Oldfield, Peerless,	Fresno, Cal.,	1904
100†	1:41:25	59.1	Burman, Buick,	Dallas, Tex.,	1909

*Against time; flying start †Competition

The Readers' Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

A NOVEL GEARBOX KNOCK

WEST UNION—Editor Motor Age—Being a constant reader of Motor Age and especially interested in the Readers' Clearing House, I am relating the following hoping that the experiences I have had with some peculiarities of motor cars will be of benefit to other readers. A model T two-cylinder Buick developed a peculiar knock. The ignition system was carefully gone over, as well as the oiler and water pipes. At last, when turning the engine by hand, the halves of the transmission case were seen to knock together, caused by a bent transmission shaft. In a 1909 two-cylinder Reo considerable missing occurred, and after the ignition system was gone over and the carbureter adjusted, it was discovered that the front cylinder was so badly carbonized that the charge was burned before it was compressed. The cylinder would not miss except when the engine was running fast. An air-cooled four-cylinder Corbin missed at the third cylinder. The valves were ground in and a new timer put on, yet the trouble continued. The engine was dismantled and the camshaft examined. It was discovered that the pushrod had worn a groove in the cam, which lifted the exhaust valve and thus allowed the exhaust valve to lift but little, if any. A new cam soon had the motor running as fast as ever.—A Constant Reader.

TOO MUCH TO FRONT CYLINDERS

Minneapolis, Minn.—Editor Motor Age—Through the Readers' Clearing House, will Motor Age explain why the two front cylinders and plugs on my Maxwell four-cylinder car carbonize quickly, whereas the two back cylinders do not. The oil supply has been regulated so that the front cylinders are getting no more oil than the back ones. I took out the plugs only the other day and found that the two back ones were perfectly clean and the two front ones were very dirty. I am using storage batteries for ignition.—E. L. Bretner.

There is no reasonable explanation as to this condition. The Maxwell lubricating system, which has an oil lead to each cylinder, and a separate crankcase compartment beneath each cylinder, should not give results of this nature. Although you think you are feeding the same amount of oil to the front cylinders, it may be you are not due to the difference in size of the drops of oil, the inference being that you have counted the drops per minute fed to each cylinder. The immediate solution is to still further reduce the oil fed to the front cylinders, or examine the oil levels in the compartments of the crankcase beneath these cylinders. It may be the oil level for these two cylinders is too high. At any rate you are feeding too much oil providing your pistons and piston rings are in good shape. If at any time you have scored the two front cylinders, or if the pistons in them do not fit properly, this would permit of oil rising on the cylinder walls past the pistons and so causing the sooting you speak of. The trouble might also be due to ill-fitting piston rings.

MAKE TWO-CYCLE CARS

Milwaukee, Wis.—Editor Motor Age—Reader's, Carthage, S. Dak., inquiry in Motor Age, issue November 25, page 18, headed, "Two-Cycle Consumption," as to what other makes of cars use the two-cycle motor besides the Elmore and the Atlas, was answered in giving the American Simplex only. I beg to state that the following concerns are using two-cycle motors in their cars: De Shaw Motor Car Co., 50 Summerfield street, Evergreen, L. I., N. Y.; Chase Motor Truck Co., Syracuse, N. Y.; Reliance Motor Truck Co., Owosso, Mich.; Wisconsin Machinery and Mfg. Co., Milwaukee, Wis.; Vickers Motor Car Co., Coshocton, O.; Coppock Motor Car Co., Decatur, Ind.; Euclid Motor Car Co., Trenton, N. J.; Kearns Motor Buggy Co., Beavertown, Pa.; Duryea Buggyaut, Reading, Pa.; Perry O'Key, Columbus, O.; S. A. Asquith Runabout Co., Waterloo, Ia. Some of these concerns are putting out three and four cars in a week. The inquirer did not ask for the names of manufacturers of two-cycle motors for motor cars, of which there are a great many in the country. The two-cycle proposition looks pretty good for 1910.—O. W. Brown.

MOTOR-CYCLE KICK-OFF COIL

Cleveland, O.—Editor Motor Age—Through the Readers' Clearing House, will Motor Age inform me what size wire and how much should be used to wind an ordinary kick coil for use on a make-and-break system using four dry cells. I want to use the coil on a 1½-horsepower Steffy motor-cycle engine. The coil I am using now has six layers of No. 16 wire and is about 7 inches long, and has exhausted one set of batteries in a little over a month's use. It seems to me that a set should last longer than that, because it has only covered about 25 or 30 miles.—R. A. Nichols.

Your current consumption is too high, and it would be better to add three or four more layers of the present wire, or use a finer grade of wire with the same number of coils. It is customary to use No. 14 wire and have eight or ten layers of it on a core ¾-inch in diameter and 2½ inches long.

A. L. A. M. RATING TROUBLES

Detroit, Mich.—Editor Motor Age—Will Motor Age give me a little light on the following: The Mitchell runabout, with cylinder sizes 4¼ by 5 and with 32 by 3½-inch wheels, is called a 35-horsepower car. The Mitchell touring car, with the same size cylinders and stroke, with the wheels 34 by 3½, has this the same horsepower? Both have the same 3½ to 1 ratio. It seems to me that the runabout with this engine and the smaller wheels would deliver a greater horsepower than the touring car with the same size engine and the larger wheels. Now, if I should buy a Mitchell touring car with the 4½ by 5 engine and equip it with 35 by 4-inch tires, would it be desirable to leave the ratio 3½ to 1, and what horsepower would I have? Would I have a stronger pulling engine and car than I had last year of this make, whose engine was 4¼ by 4½ and 32 by 4 wheels? In reading some of the advertisements I notice the Jackson model 30 is listed as the 30 horsepower, the motor being 4 by 4, with 32-inch wheels; the Haynes car has a motor 4¼ by 5, and is listed at from 45 to 50 horsepower; and the Mitchell, with the same size motor, only lists at 30 to 35 horsepower. In a recent description in Motor Age it was rated at 28.9. The advertisement of the Velie car, with the motor 4½ by 5¼, gives 40 horsepower. I think that the majority of motor car buyers, and possibly many of the readers of Motor Age, have not this horsepower business fixed definitely in their minds.—E. P. Andrews.

Your horsepower dilemma is but one of many hundreds of car owners. You should understand at the start that there is absolutely no horsepower formula which will give the accurate efficiency of motors. The real efficiency of a motor in a factory can be tested only by the dynamometer, the brake, or some other suitable form of test, in which the actual power delivered at the flywheel is measured. This is not sufficiently accurate for cars, because once a motor is mounted in a running gear, there is nothing to show the efficiency of the chassis, which would include the efficiency of the transmission, clutch and rear axle. The only real test of power efficiency would be a test at the rear wheels, which is being made by some makers at the present time, but they do not give out the figures regarding such.

The A. L. A. M. horsepower formula has been adopted only as a sort of ready-reference guide by which the power of different motors can be compared with reasonable accuracy in a brief period of time. In order to reduce this formula to the simplest possible condition, the stroke feature has been eliminated apparently, although it has not, in reality, because the formula is based on the piston speed of 1,000 feet per minute, so that if you have two motors with the same bore but different stroke, it is understood that for them to generate the same horsepower the crankshaft of one will turn faster than will that of another. For example, take two motors—one, A, 5-inch bore and 12-inch stroke; the other, B, 5-inch bore and 6-inch stroke. According to the A. L. A. M. formula, if each were a four-cylinder type, the rating of both would be 40-horsepower, but it seems absurd to say that they would both give the same power, in that one has a stroke double that of the other. This, however, is taken care of by the piston speed of 1,000 feet per minute. To explain: For every revolution of motor A, with its 12-inch stroke, the piston travels 24 inches, or 2 feet, so that the crankshaft of this motor would have to revolve at 500 revolutions a minute to give 40-horsepower. In motor B, with the 6-inch stroke, the piston travels 1 foot every revolution and the crankshaft would have to rotate 1,000 revolutions per minute to give you a piston speed of 1,000 feet per minute. With either motor the horsepower generated will, up to a certain limit, depend largely on the crankshaft speed, and without knowing this it is impossible to arrive at an estimate of what the real horsepower will be. Many motors today have piston speeds in excess of 1,000 feet per minute, some of them going as high as 1,800 in short contests.

In strict accordance with the A. L. A. M. formula, your Mitchell motor with 4¼ by 5-inch cylinders has a rating of 28.9 horsepower, and the touring car with the same cylinders has the same rating. It is understood, of course, that any difference due to 32 or 34-inch wheels is taken care of by the proper gear reduction at the differential. The Mitchell runabout would have more power with the same gear ratio as used in the touring car, because of the touring car having the larger wheels. Each rotation of a 32-inch wheel carries the car forward 101.53 inches, whereas each rotation of a 34-inch wheel takes the car forward 106.81 inches, or 5.28 inches more. It is understood that it takes additional power to propel the car that extra 5 inches, which has to be carried as an extra load on the three and one-half rotations of the crankshaft, and which is the reason for assuming that the runabout will give you more power.

If you were buying a car with 4¼ by 5-inch cylinders and 34-inch tires, it would be advisable to change the gear ratio unless the motor has sufficient surplus power to care for the needs of ordinary touring purposes. It is impossible to say whether you would have a stronger pulling engine than last year, because of the fact that it is impossible to compare satisfactorily a 1910 motor with a 1909 one, even at the same rate. The motors for next year have been improved in many respects, and it is natural that they have greatly increased power. The A. L. A. M. rating of the Jackson car with 4 by 4-inch cylinders is 25.6. The Haynes, with 4¼ by 5, has a rating of 28.9. The Velie car, with 4½-inch bore, has a rating of 32.5.

SMOKING OF MOTORS

Chicago—Editor Motor Age—Please give some of the various reasons for motor smoking and how this may be prevented.—M. B.

There are several reasons for smoking from a gasoline motor. If too much gasoline is fed, a black, heavy smoke will be emitted, which only can be avoided by reducing the amount of gasoline fed by the carbureter. On the other hand, if the smoke is blue, it is an indication that too much oil is being fed, and that the gasoline is not at fault. There are several reasons for smoke caused by burning oil. In the first place it means too much oil is being fed, but in a four-cylinder motor it may be that too much oil is fed to one or two of the cylinders, whereas the other two cylinders may not be getting enough. Motor builders have guarded against this, however, by making cross partitions in the crankcase so that the oil cannot flow from one end to the other, as illustrated at A, Fig. 1, so there remains an oil level in the front compartment, C, and a similar level in the rear compartment, C1. In this way the splash to any of the four cylinders always should be the same. Some manufacturers have gone even further, having three partitions, placing two others at the points A1 and A2, so that each of the four connecting rods has a separate oil well into which it can dip. This precaution by makers has greatly helped in preventing smoking. Still others place standpipes, P, in each compartment, so that excess oil above the desired level is drained off or conducted back to the oil supply the motor but simply a matter of doing so.

A second method of preventing smoking is to place a baffle plate in the open end of the cylinder, as indicated in Fig. 2. In this baffle plate is a slot, in which the connecting rod works. The object of this baffle plate is to prevent an excess of oil finding its way into the open mouth of cylinder. If too much oil is splashed into the cylinder, it will be carried up by the piston, and too much of it will get above the piston, where it will be burned by the combustion and so pass out in the form of smoke. Many of the leading makers use baffle plates of this nature, and so try to restrict the amount of oil which is splashed into the cylinder This suggests the point that with an ordinary splash system there is no difficulty in getting enough oil to lubricate the cylinder's walls and the piston rings, but the trouble is to get it into the right proportions, there being a danger of too much at one time and not enough at another time. A common method of preventing an excess of oil getting past the piston or between the piston rings and the cylinder wall and thence to the top of the piston, is to place a piston ring near the base of the piston, whereas the ordinary compression rings are placed near the top of the piston. The object of this ring is that on the down stroke of the piston it may carry off the cylinder wall a certain amount of the oil which has been splashed thereon, thus preventing too much getting above the piston. The Pierce company for next year has introduced a groove, G, Fig. 3, in the base of the piston which accomplishes the same results and by this scheme claims to have accomplished a great economy in the amount of oil used. This groove has a right-angled edge at the top side, but is sloped off at the base so as to scrape all of the walls and pull it downward.

With any case of smoking the smoke is due to excess oil getting above the piston, and there are several causes for this. If the piston rings fit poorly it is natural that the oil will have a chance to work past and it is equally a fact that on the explosion stroke the force of the explosive gases will tend to blow the oil downwards

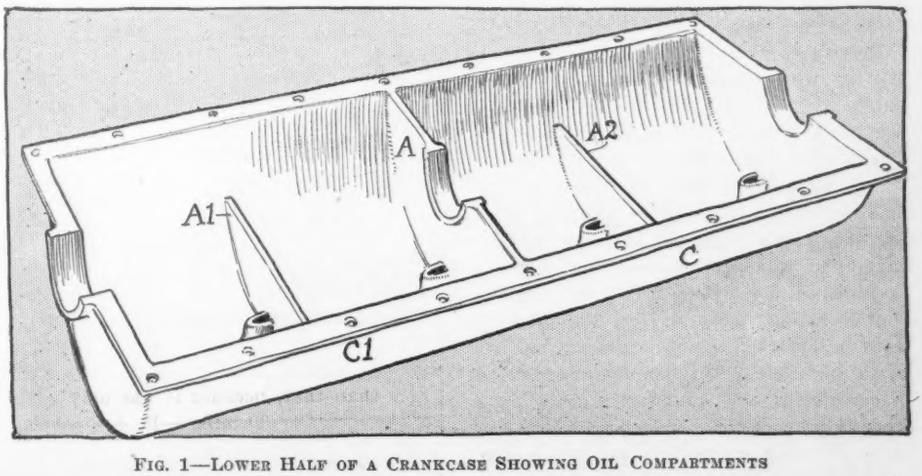


FIG. 1—LOWER HALF OF A CRANKCASE SHOWING OIL COMPARTMENTS

in the space between the piston and cylinder walls. One feature which frequently causes oil to rise is the partial vacuum formed in the combustion chamber in case the intake valve is not open until after the top dead center. Should the opening of the valve be delayed until the piston is on the down stroke, as it is in some cars, the partial vacuum period tends to suck the oil on the cylinder wall up above the piston where it is burned during the explosion. While this is taking place there is another cause which assists, namely, the variations in the compression in the crankcase. It might seem impossible that in a four-cylinder motor where two pistons are rising and two descending at the same time, that there would be any change in the crankcase pressure. There is, however, a constant change in this pressure in the different cylinders, often due to gases which are forced past the piston during an explosion. This crankcase pressure, although a small factor, nevertheless plays its part in forcing oil upwards past the piston.

Where a motor is lubricated entirely by splash and no provision is made for maintaining a constant level of oil in the crankcase compartments, it almost is impossible to prevent smoking. Motor Age readers are familiar with the condition where, after pouring more oil in the crankcase, a cloud of smoke follows the car until the oil level is reduced to a more normal point, when the smoking immediately ceases. Where a splash system is depended upon there should be provision for maintaining a constant level in the different compartments, otherwise it will be impossible to prevent smoking. Smoking in old motors has been traced on several occasions to the cylinders having worn obliquely. When the cylinders were new they were perfect, but, due to the constant side thrust on the down stroke of the piston, one side wore slightly, giving the oval effect, the pistons not adapting themselves perfectly to this abnormal condition, permitted excess oil to work its way above the piston heads, with the result that the only solution consisted in the reboring of the cylinders, bringing them to the circle.

FOR CHICAGO-ROCKFORD TOURISTS

Belvidere, Ill.—Editor Motor Age—Kindly warn motorists who are in the habit of making the Chicago-Rockford run that between Belvidere and Garden Prairie, at Coon creek, a new bridge is being constructed and it almost is impossible to get through. A Packard touring car driven by Frank E. Long, of Chicago, had a heart-breaking time getting through on November 20. From Garden Prairie to Belvidere, or from Belvidere to Garden Prairie, what is known as the north road should be taken until the bridge is completed. To go on the north road from Garden Prairie, cross north over the railroad near the creamery and after passing the narrow twin bridges 60 rods distant, turn at the first turn left and follow this road straight into Belvidere. From Belvidere this road is reached by going out on East Lincoln avenue without a turn except as the road angles. The turn at Garden Prairie is 6 miles away at the end of the road to right.—Frank T. Moran.

FIG. 2—SHOWING BAFFLE PLATE IN PLACE

OIL FOR WATER RADIATORS

Dixon, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age inform me whether or not it will be all right to use a real light oil in place of water in the radiator in cold weather.—Subscriber.

While it is true that oil can be used in the cooling system, it is equally true that data of its performance is lacking. Water has the highest specific heat and is the best for the work; winter's troubles are to be coped with, however, and although glycerine is a little troublesome, yet even so, it is probably safer to employ than lubricating oil. Twenty-five per cent of the whole weight in glycerine, the balance water, makes a good solution, and it will prevent freezing troubles.

HUDSON'S VANDERBILT TIME

Seattle, Wash.—Editor Motor Age—Will Motor Age kindly answer through the Readers' Clearing House if it is true, as stated in Motor Age, November 4 issue, that the little Hudson car made a lap in the Vanderbilt cup race in 11:10, or at the rate of 67.9 miles per hour, and if it was a regular stock car with regular bore and stroke of 3⅞ by 4½.—B. J. P.

Regarding the performance of this car Motor Age cannot say further than that this was the time given out by the timers. There were errors made in the timing on that occasion and it was the general opinion that this car did not make the lap at that speed, in spite of the fact that the time was given out as official. It undoubtedly was a stock car, because it passed the examination of the technical committee.

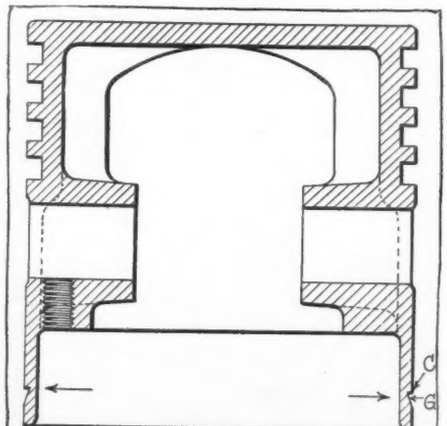


FIG. 3—OIL GROOVE ON PIERCE PISTONS

SELDEN PATENT INFORMATION

Kendallville, Ind.—Editor Motor Age—Will Motor Age kindly inform me what restrictions are placed upon manufacturers desirous of engaging in the manufacture of motor cars in the way of licenses, etc.? In other words, what is the significance of the term, "licensed under the Selden patents"? Is it necessary that any license or permit be procured before the manufacture of motor cars can be started, or does it merely affect the use of the term "automobile"?—Raber & Lang Mfg. Co.

The Selden patent is a patent which refers to the combination of a clutch operating between the motor and drive wheels in a motor vehicle of any nature. Since the recent court decision sustaining this patent, the holders of the patent are empowered to collect a certain royalty from all concerns building cars. The holders of the patent can, at their will, prevent new concerns starting the manufacture of cars, since the court decision sustaining the patent, should they so desire. It is now necessary for concerns building cars without a license to procure, if possible, license for such permission. The term does not apply simply to the term "automobile," but to motor vehicles in which a clutch is employed in combination with the transfer of power from the motor to the drive wheels.

RETURNING SPEEDOMETER

Roseland, Nebr.—Editor Motor Age—How can a Stewart speedometer which shows the number of miles, be set back to zero in order to put on a new car? Can a mechanic do it, or could it be run to its limit and will it then automatically return to zero?—Gus Bourg.

A good mechanic can reset this at 0 by removing the glass cover. This can be done by driving out the three pins which hold the rim which secures the cover in place. This done, with the aid of a prick punch, the three dial pointers may be returned to 0, after which the cover will have to be replaced, the holes redrilled for the three pins of the retaining rim and three new pins used. It is possible to rotate the speedometer dial back to 0 by holding the small gear, or pinion, on a belt. This has been done in less than 30 minutes, and it is a simpler method.

The Motor Car Repair Shop

A BUSINESS man from up in the state of Wisconsin visited Milwaukee to purchase a car. He wanted a machine with plenty of speed and power but not too heavy. He found what he wanted and after a most strenuous d monstration which had occupied the entire afternoon he left about 8 o'clock in the evening for his home, over 200 miles away, with the car, its driver, and a tank full of so-called .76 gasoline. The car covered 65 miles that evening before 12 p. m.; was then placed in an unused barn for the night and its occupants retired to the hotel, both well pleased with its performance. The next morning, although the barn was quite cold, the motor was started with one turn of the crank and the journey continued. Half an hour after the departure the little car was again bristling with energy, and the promptness with which it responded to every move of the throttle, and the way it scurried up hills, and through sand, surprised even its driver. Shortly after noon, the tank being half empty, the gasoline supply was replenished at a grocery store in a small town, and the destination was reached at about 4 p. m. The rest of the day and evening was spent in showing the family and friends of the owner what the new car could do. The machine was again left in a cool barn over night, but when an effort was made to start the motor in the morning it refused to start till the cylinders were primed with gasoline drawn from the supply tank; then after about fifty revolutions it stopped just as suddenly as it had started. The carbureter was then drained and over 2 ounces of water ran from the pet-cock before the gasoline began to flow. Again cranking the motor briskly, it started without priming, and after a slight adjustment of the carbureter the car again was put into service. The entire day was occupied in demonstrating, but the motor had lost much of the energy previously displayed. The next morning the driver returned to Milwaukee, leaving the car and a few instructions with the new owner, who immediately ordered some good gasoline. A week or so later word was received that the new gasoline had entirely rejuvenated the motor.

Hints to the Amateur

Useful Shop Tools

One of the most useful and simple sets of special tools to be found in some repair shops is that shown in Fig. 2. It consists of three or four U-shaped pieces of ¾-inch square iron, and some long bolts with nuts and washers. By using a long U piece as the beam, and two short U pieces to fit behind the spokes of a road wheel, with the use of three long bolts with nuts and washers, the outfit may be conveniently

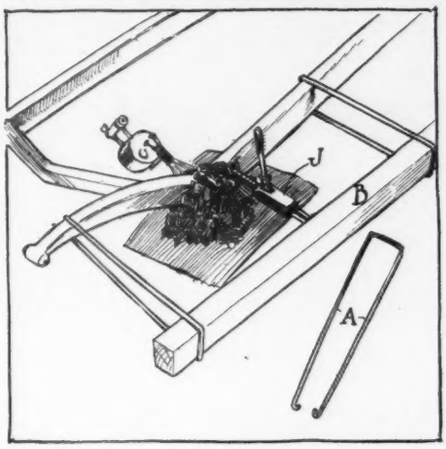


FIG. 1—STRAIGHTENING A FRAME

employed as a wheel puller. As illustrated in Fig. 2, a timing gear is being removed from the end of the crankshaft of a motor. In this case only two of the U pieces are brought into service, the sides of the piece in back of the gear being of exceptional width so that it could clear the boss on the end of the crankcase and the shoulder of the gear. These U sections are so easily made that quite an assortment may be had at a very small cost. In removing a timing gear as shown in Fig. 2, after having assembled the parts into position as illustrated, it only is necessary to hold the nut on the center bolt with one wrench and screw it on the center bolt with another. When using a device of this kind for pulling road or gear wheels, etc., some care should be exercised in fitting the parts together so that the side bolts are both adjusted to the same length in order that the strain be equally distributed when the center bolt is screwed up. When a fairly stiff strain has been put on the center bolt of this or any other kind of a wheel-puller, and the wheel refuses to yield, one or two sharp taps on the top of the head of the center bolt may start the wheel on the shaft. These U-shaped pieces, together with bolts of different lengths and washers, are extensively used by the machinist for clamping articles to the face-plates of lathes and drill-presses and the like.

Straightening a Frame

A short time ago four odd-looking tools, one of which is illustrated at A, in Fig. 1, were seen hanging on the wall of a local repair shop. On inquiring as to their use, the writer was informed that they were utilized in straightening chassis frames, as shown in the sketch Fig. 1. As a result of a collision, the front end of one of the side members of a motor car frame was bent. To make the repair, the radiator was removed, a pan of charcoal was placed under the frame, and pieces of charcoal heaped up around the bend as designated; the frame then was heated up about the bent portion by playing upon the pile of charcoal with the flame of a blow torch. As the frame was brought to a cherry-red heat, two of the tools mentioned above were applied to the frame, and used in connection with a wooden beam B which supported the jack J. The torch now was set aside, the charcoal removed, and while one man carefully operated the jack and slowly drew the bent member back to its proper shape, another deftly assisted the operation by tapping and contouring the heated section with a hammer. This hammering is quite necessary and an important factor in bringing about a successful result as it assists the molecular action of the steel, and prevents the end of the frame from springing back out of line as the job cools off. The entire straightening process must be done while the injured section is red hot and the job completed before the red color is lost.

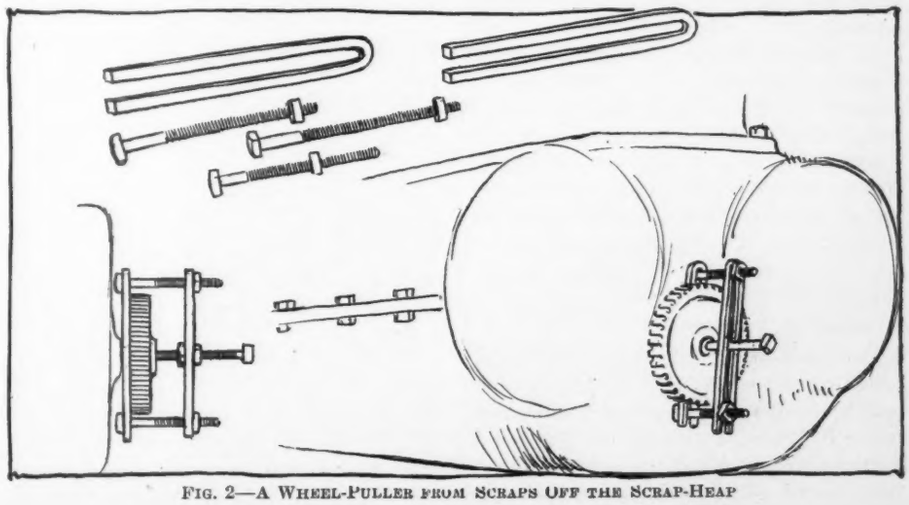


FIG. 2—A WHEEL-PULLER FROM SCRAPS OFF THE SCRAP-HEAP

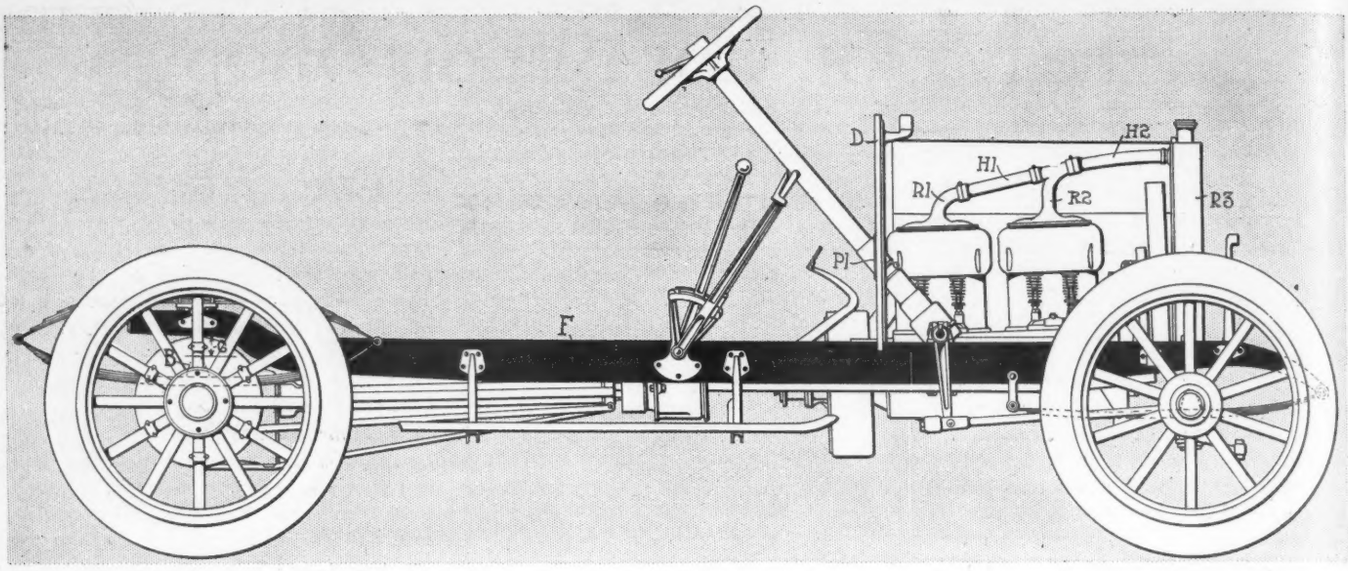


FIG. 1—ELEVATION OF MARMON 32 CHASSIS FOR 1910, WITH ITS IMPROVEMENTS

Marmon 32 Chassis for Next

STANDARDIZED product does not of necessity remain absolutely unchanged in every minor particular for an indefinitely long time; it is the standard that advances, and when a car is kept up to standard is must be refined from year to year by that standard. For this year the Nordyke & Marmon Co., Indianapolis, Ind., is meeting the market with the Marmon 32, with all the little refinements necessary to keep abreast of the standard, among which a lengthened wheelbase, bringing it up to 116 inches, and changing some of the other dimensions accordingly. The steering mechanism also has been advanced to a higher plane by having the cross tierod come to the rear of the front axle and high enough up to protect the linkages perfectly. Then, the mode of suspension of the motor at the rear is changed; a separable crossarm, K of Fig. 2, is flanged to the motor and held in place by means of eight bolts; this arm extends across to the respective members of the chassis frame and engages a large-diameter pin in a shackle, which, in turn, is riveted to the chassis frame.

The body work is on a somewhat higher plane; the cast aluminum plates which enter the body construction are from a mixture which affords smooth castings, are light and the finish they take is better than that obtainable in any other class of material coming within Marmon experience. The advantages of cast aluminum for this class of work has been thoroughly proven out. Advances made in materials within a year, although they represent no radical change, are of more than a little moment, and have been taken into account in Marmon practice.

Products of the Plant

The products of this well-known plant for many years was mill machinery, and long before the motor car was a noticeable factor in industrial life the company used micrometers instead of carpenters' rules; jigs instead of approximations, and system long ago became a habit. This year the motor car branch of this company comprises a 32 chassis, with touring, suburban, roadster, coupé, limousine or landaulet bodies, at the option of patrons.

The scheme of design is outlined in Figs. 1 and 3, of the chassis, in side elevation and plan respectively. Although the specifications cover all that the chassis drawings show, even so, there are certain accentuated points in design that greet the eye and demand further recognition. The drop frame, F, of the channel section is 4½ inches deep, with good clearance from the axles, especially at the rear, where the motion is the most pronounced, it being fully 4 inches at C, Fig. 1, between the under side of the frame and the top of the bumper; the give of the bumper, B, adds to the clearance. The rear spring suspension is elliptic, 42 by 2 inches, which is indicative of easy-riding qualities.

Features of the Motor

The four-cylinder, water-cooled motor is provided with a high raiser, R1 and R2, with a flexible connection, H1, between the two pairs of cylinders, and H2 from the front pair of cylinders to the radiator. The radiator, R3, is in a line above the front axle, and the over-all distance from the center line of the front wheel to the front edge of the mahogany dash, D, is 34¾ inches, which length is enough to balance the general appearance of the car. The steering column is securely braced at the point where it passes through the dash and held in secure relation by means of a plate, P1.

The plan of the chassis presents evidences of strength, as, for illustration, the flanges of the side members, S1 and S2, are widened as the dash is approached —see Fig. 3—and where the side members are narrowed in, supports are close at hand to tie up the work. The clutch shaft, C, passes clear across, and the brackets, B1 and B2, are riveted to the frame, and journals, one of which shows as T, are long and well fitted. What is true of the clutch shaft also is to be said for the brake shaft, B3, and in the same illustration the equalizers for the brakes, at E1 and E2, will be easier to discern than in any other view available. The rear cross member, M1, of the frame is provided with

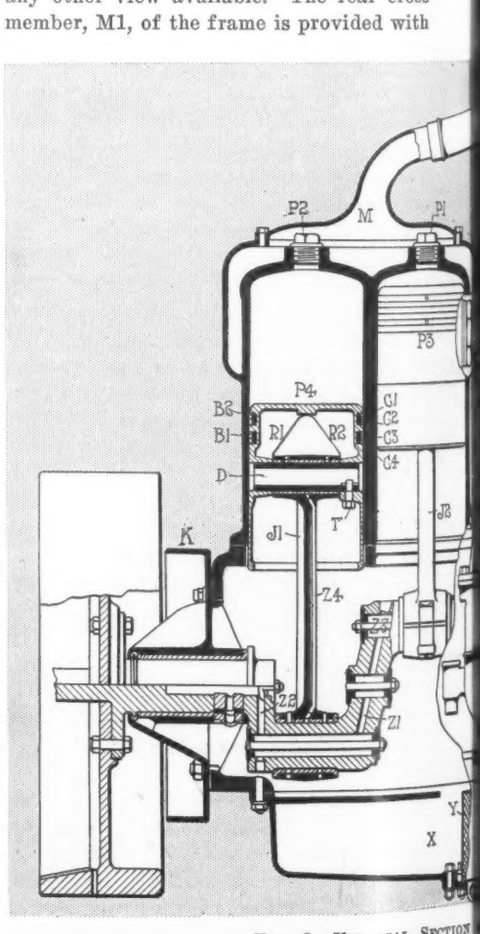


FIG. 2—VERTICAL SECTION

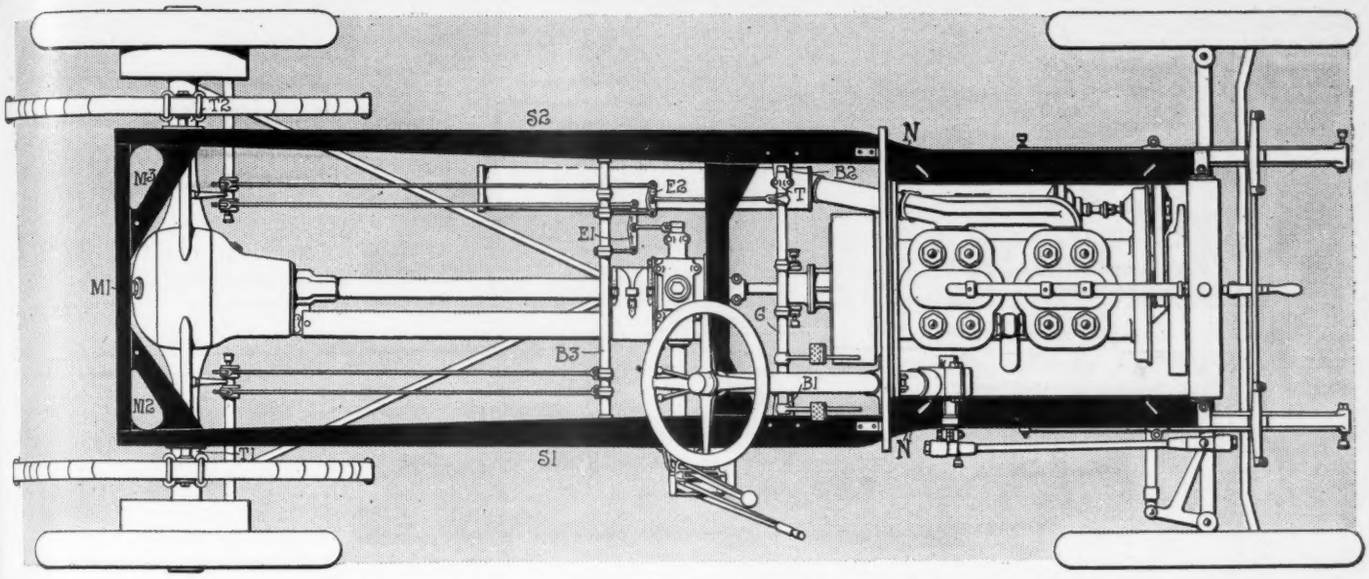
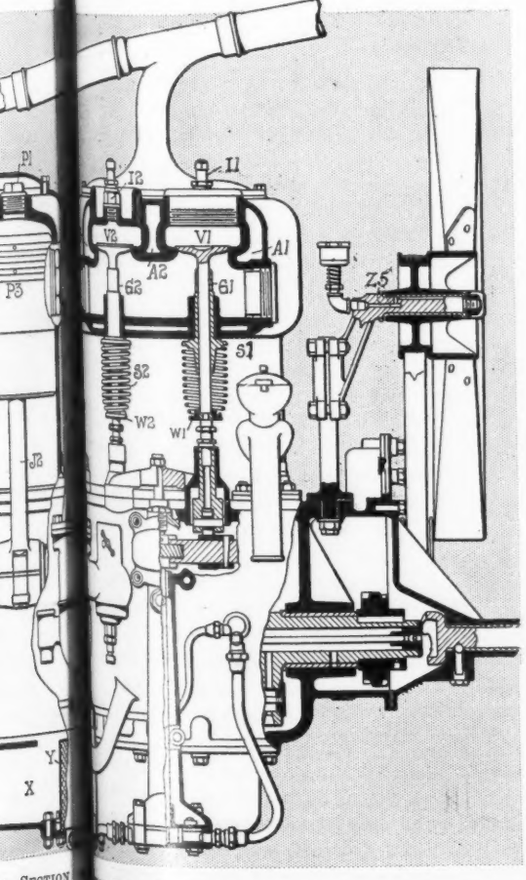


FIG. 3—PLAN OF MARMON 32 CHASSIS, SHOWING CAREFULLY MADE FRAME SIDE MEMBERS

Season With Detail Illustrations

unusually liberal corner braces, M2 and M3, and the rear spring trunnions, T1 and T2, are provided with wide flanges and are securely riveted to the side frames.

Referring to Fig. 2, of the motor, looking at the intake side, which is the right hand side when the motor is in place in the chassis, the front pair of cylinders are shown in part section cutting through the intake valves V1 and V2. The valves run in sized guides, G1 and G2, and the valve springs, S1, S2, etc., press against a flange turned on the guides, whereas the other ends of the springs rest on concentric washer-like supports, W1, W2.



L SECTION OF FOUR-CYLINDER MOTOR

Plugs Over the Valves

The spark plugs I1, I2, of which there are four on the intake side, are directly over the valves, and sooting and heating are eliminated. The waterjacket extends all around the valve seats, as shown at A1, A2 and A3, for the first pair of cylinders, which plan is, of course, duplicated in the second pair of cylinders. Referring to the second pair of cylinders in the same illustration, the plugs in the heads, P1, P2, are threaded in, pass through the inner wall only, and are submerged in water. The waterjacketing is augmented by the bell-like shape of the water piping make-up, M, which is the same for each pair of cylinders, and the volume of water thus stored above the hottest part of the cylinders is insurance against cooling trouble.

The pistons, P3, P4, have flat heads, are strongly supported by ribs, R1, R2, and the packing is done to maintain compression by means of compound rings, B1 and B2, in grooves for each piston, which rings support auxiliary rings, C1, C2, C3 and C4, on each piston. The method of packing is one that has long been favorably considered in steam and other work and the continued tightness in service is its best recommendation.

The piston pin, D, is hollow, of alloy steel, hardened and ground, and is prevented from floating by a cap screw, T, threaded into the boss and turned to fit in a hole in the piston pin. The connecting rods, J1, J2, are I-section, drop-forged from suitable grades of steel, and a bushing of bronze assures a good bearing at the piston pin in each case, and proper journal members, split and securely bolted, takes care of the crankpin bearings.

The reciprocating mass is reduced to a minimum, due to light pistons, connecting rods, and a sufficient stroke to reduce the connecting rod angularity to a safe point. Lubrication, which is positive and worked out to a nicety, does what is left by way of accounting for the fine performance. This lubrication, as the design reproduction indicates, is rendered positive by means of oil-ways reaching up from the oil in the sump, X. After the oil is strained through the strainer, Y, it is pumped into the oiling system and as an indication of the means afforded, attention is called to the oilways in the crankshaft Z1, Z2 and Z3, also in the connecting rod Z4, leading up to the piston pin.

Glance at Fan Details

Before departing from the discussion of the motor a glance at the fan detail will disclose a point or two. The fan is large, is driven by a wide flat belt, and the bearings are lubricated by a grease-cup, pressing hard lubricant in through the passageway Z5. The fan support is strong and is to the crankcase.

Fig. 4 refers to the flywheel, F1, made of selected gray iron, cast in the Marmon foundry, at the plant where the cars are made, and instead of keying on, the flywheel is flanged to the crankshaft at F2, and is held in place by means of through bolts, B1, B2, etc., with nuts, castellated, and locked, N1, N2, etc., by cotter pins. Any oil that accumulates within the flywheel is driven out by centrifugal force through holes around the periphery, one of which is shown at H1.

The cone member, C1, has a dished spider made of aluminum, and because of its shape all internal strains are removed and safety is assured. The leather face, L1, is of a selected variety of clutch leather and rivets, R1, R2, etc., hold the leather to the cone face. Leather, when it is used in cone clutch work, if it is not pressed out by means of springs, is

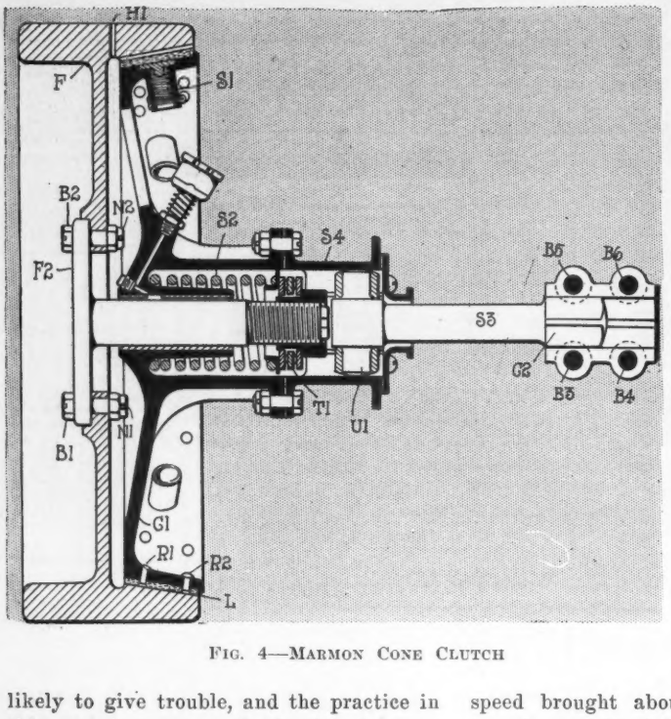


FIG. 4—MARMON CONE CLUTCH

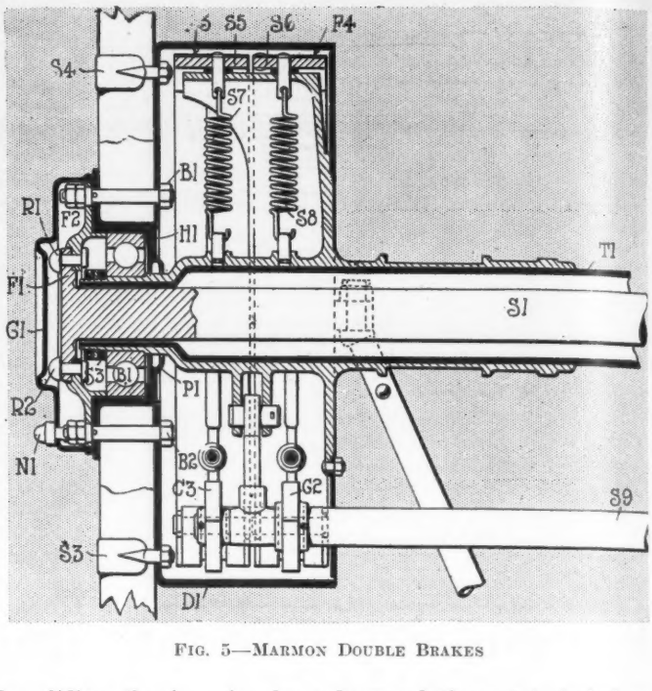


FIG. 5—MARMON DOUBLE BRAKES

likely to give trouble, and the practice in this case is to cause the leather to press out by placing coil springs, S1, behind mushroom-shaped members, M1, at points around the periphery.

Construction of Clutch

The clutch is pressed into engagement by the concentric coil spring, S2, and the reaction is taken by a ball thrust bearing, T1. The shell, S4, is flanged to the extension of the cone spider just over the thrust bearing, and a universal member, U1, takes the power on its way to the live rear axle, passing it through the stub-shaft, S3, to an accommodation coupling, C2, which is split and held together by means of four large bolts, B2, B4, B5 and B6.

The motor and clutch making up one unit, leaves the transmission, attached to the live rear axle, as the second unit, and the section, Fig. 6, which is taken through the propeller shaft center, will show enough of this system to bring out the points to be made. The transmission gear is of the selective type, with three forward speeds, giving direct drive on high speed brought about by sliding the internal gear, G1, into mesh with the teeth of the pinion, G2. Hill-climbing gear is let in by meshing the external teeth of G1 with the teeth of G3, when the gear ratio is unity, due to the fact that both gears have the same number of teeth; this leaves the bevel drive as the only means of gear reduction in intermediate speed, which reduction is that due to fifty-three teeth in the bevel gear and sixteen teeth on the mating pinion or 3.31 to 1. Low gear used for accelerating is let in by meshing G4 with G5, and the reverse requires that G6 and G7 engage with G4.

The bevel drive, involving B1 and B2, with the latter flanged to the differential housing by bolts B3, B4, etc., is held in rigid relation by the large-diameter shaft S1, and the large annular ball bearing, B5, which is a sucking fit, and presses against the shoulder, S3, is held on by pressure of the bevel pinion B1, and the end of the shaft is threaded, T1, so that the nut N1 is screwed up against the washer W1, locking the whole system in place. The pinion is prevented from turning by a key, and the nut is locked on by means of a wire in a groove, L1.

Lay Shaft Relatively Short

The lay shaft, S2, is of large diameter, relatively short, hence rigid in the extreme. The gears are keyed on at K1 and K3, are of hardened special steel and of a shape to resist deformation in the process. The primary shaft, S1, is a square and the sliding gears are, like the fixed gears, hardened and of a shape to stay put. At the telescoping joint the gear G2 serves as a sleeve, and annular ball bearings, B6 and B7, carry the load. Dirt is excluded by means of the housing, H1, which engages the torsion tube, T2, which is in concentric relation with the propeller shaft, P1.

The axle drive shaft, S1, Fig. 5, is flanged at its end, F1, and a supplementary flange, E2, bolted thereto, is faced off and fits against a face on the hub member, H1, of the rear wheel. The hub is bored out to take a single annular ball bearing, B1, and this bearing, although it does all the work, is dead on the center line of the wheel, so that it is in a position to assume all the responsibility. The ball bearing is a sucking fit on the reduced diameter of the bronze sleeve, and this sleeve fits over the drawn steel tube, T1, which is concentric with the drive shaft.

The ball bearing is held securely in place in the most approved manner by means of a locked threaded shell, S3, and the axle shaft, which is of the semi-floating type, is prevented from floating off by the interference of the petticoat, P1, of the hub acting in conjunction with the flanges F1 and F2, they in turn being secured in place by means of the hub flange bolts B1, B2, etc., and the rivets R1, R2, etc. The hub cap, C1, fits over

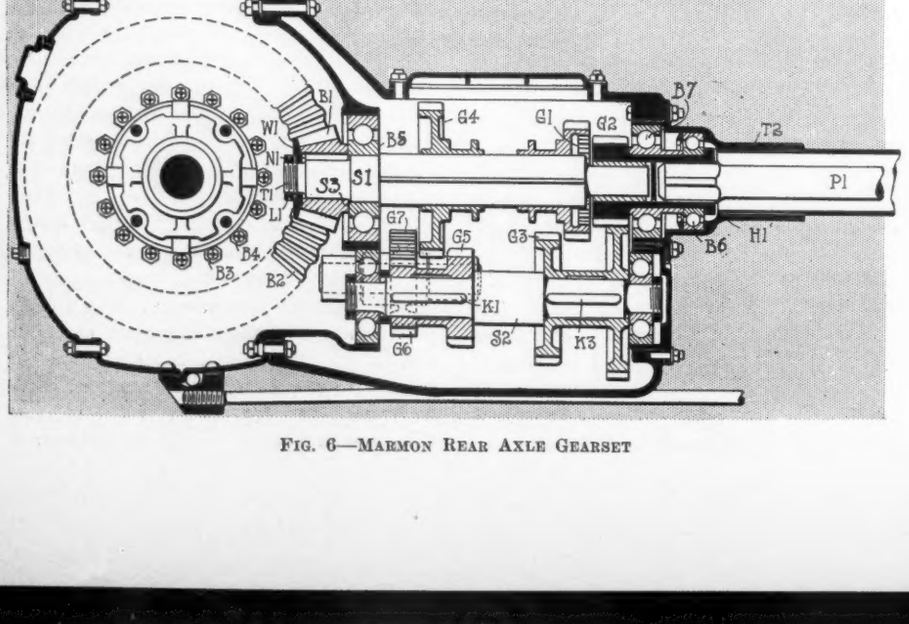


FIG. 6—MARMON REAR AXLE GEARSET

(Continued to page 29.)

Legal Lights and Side Lights

SETTLES TRAFFIC RULES CASE

THE Massachusetts supreme court has handed down a decision relative to a violation by a motorist of the traffic rules governing Boston's streets that is interesting. Some time after the regulations went into effect Fred T. Allen was arrested for a violation of the rules requiring him to drive his car on the right on Massachusetts avenue. Mr. Allen fought the case. His defense was a novel one. He contended that the regulations were illegal and void because not advertised in the manner required by the act of 1908 under which the commissioners were empowered to make the rules. The requirements of the statute were that the regulations were to be advertised for at least 2 weeks in two or more newspapers in Boston. In the period during which the regulations were published Sundays and Christmas were omitted and the defendant contended that the advertisement for at least 14 consecutive days including Sundays and holidays alone would satisfy the statutory requirement. The court holds that the statute was not susceptible of the construction urged by the defendant, and that the statute required only such an advertisement in 2 weeks as may be reasonable notice to the people, and the advertisements in this case were sufficient. As to the legislative intent to have the advertisements on Sundays the court said: "Unequivocal, unmistakable and imperative language would be needed in this commonwealth of Puritan tradition and performance to show a legislative intent requiring work to be performed on the Lord's day."

SUSTAINS STATE LAW

In the Delaware county court at Media, Pa., last week Judge William B. Broomall handed down a decision reversing Justice of the Peace Charles W. Burnley, who on July 21 last imposed a fine of $5 and costs on Wilmore B. Taylor, charged with driving his car on the streets of Swarthmore after sunset without lighted lamps. Taylor appealed on the ground that when arrested, about 7:45 in the evening, the time limit for lighting up—1 hour after sunset, according to the new state law—had not yet expired. Justice Burnley contended that the borough ordinance, which required that lamps should be lighted at sundown, must be observed within the borough limits. The attorney for the defense, after citing the state law on the subject, called attention to section 15 of that statute, which reads: "No city, county, borough or township shall have power to enforce or maintain any ordinance, rule or regulation inconsistent with * * * this act; * * * and all such local ordinances, rules or regulations now in force shall expire and shall be null and void and of no further effect." In his opinion Judge Broomall says: "That the state has the power to legislate upon the police regulation of its highways is without question," and refers to the trouble that would be experienced were each borough and municipality permitted to enforce different and changing regulations on the subject. The clause in the new state law requiring the carrying of lighted lamps from "1 hour after sunset until 1 hour before sunrise" confers upon the motorist the "right to proceed without them during the remainder of the 24 hours," and the Swarthmore borough ordinance, in "imposing a longer time for the display of lights than that which is imposed by the state act is manifestly inconsistent with the spirit and reason of the statute and consequently is invalid." The court therefore ordered "that the judgment entered by Justice of the Peace Burnley in favor of Swarthmore borough and against W. R. Taylor be set aside and the costs paid by the borough." Mr. Taylor is a prominent member of the Automobile Club of Delaware County, whose legal committee upheld him in his fight for justice.

DEFENDS PROPOSED TAX

Erich Cramer Stern, Milwaukee alderman, has issued an interesting defense of his proposed ordinance to tax all classes of vehicles. If the people of Milwaukee want better streets, more pavements and a better maintenance of existing pavements, he says, a vehicle tax is necessary because the sources of revenue for this purpose now produce too little. The abutting property owner pays for the initial improvement of making a new street, but after that he should not be made to contribute or bear the entire cost of maintenance until a permanent pavement is laid. The property-owner usually gets very little use for his contribution, and it is only fair, says Alderman Stern, that those who use the streets should maintain them.

CAN PUNISH ROAD HOGS

The circuit court at Racine, Wis., has upheld the Racine municipal court in its action of fining a man for obstructing the roadway. Ernest Nowak, a Caledonia farmer, held the center of a narrow road for more than an hour when asked by Henry Plow, a member of the Mitchell Motor Car Co., of Racine, in his touring car, for room to pass. Nowak kept apace of about 4 miles an hour. Plow brought suit for malicious obstruction of the highway, Nowak was convicted and fined $10 and costs. He appealed to the circuit court, but the lower court's decision was affirmed. This was the first prosecution of this kind ever brought in Wisconsin, so far as known, and the decision therefore sets an important precedent.

DISCUSSING HIGHWAY LAWS

The special legislative committee on good roads of the Wisconsin legislature is completing its work in Milwaukee this week and soon will formulate its report to the special session in January. It is estimated that the Michigan idea of building good roads has found favor among the Wisconsin investigators, and that a system such as is in vogue in Michigan will be adopted. Chairman J. B. Jones explains the proposed Wisconsin system thus:

"The award system, which is the best we have found, is a boon to any state. The various counties and towns build roads and then get a sort of rebate from the state if the roads are up to standard. For instance, the state pays say $250 a mile for roads built of a combination of dirt, gravel and stone; $500 a mile for roads improved with a double course of gravel; $750 a mile for stone and gravel, and $1,000 a mile for straight macadam."

The committee spent much time in Michigan and Ohio. Chairman Jones tells of a macadam road between Menominee and Escanaba, Mich., 60 miles, on which the members, in motor cars, passed a man with a small team of horses was hauling with ease two wagon loads of crushed stone, one wagon trailing the other. Wisconsin has more good roads material than any other state, members of the committee say. All over the state there are surface outcroppings of hard rock. Fences in Door county are built of native limestone. A macadam road could be built there of limestone at $1,000 a mile. There are vast beds of granite, quartzite and other material throughout the state. The main problem would be distribution.

HEEDING SIGNBOARD LAW

Townships in the vicinity of Fond du Lac and West Bend, Wis., are taking the lead in erecting guide boards, as demanded by a law passed by the last legislature. These boards were to have been placed by November 1, but farmers claimed that harvest work halted them and they have asked for a little more time. In Fond du Lac and Washington counties a new type of guide board and standard is being used. It is the invention of a Campbellsport man and manufactured by a big woodenware company at Campbellsport, Fond du Lac county. The post is a hollow steel pipe, set in concrete, with a special bracket at the top, with room for six sign boards.

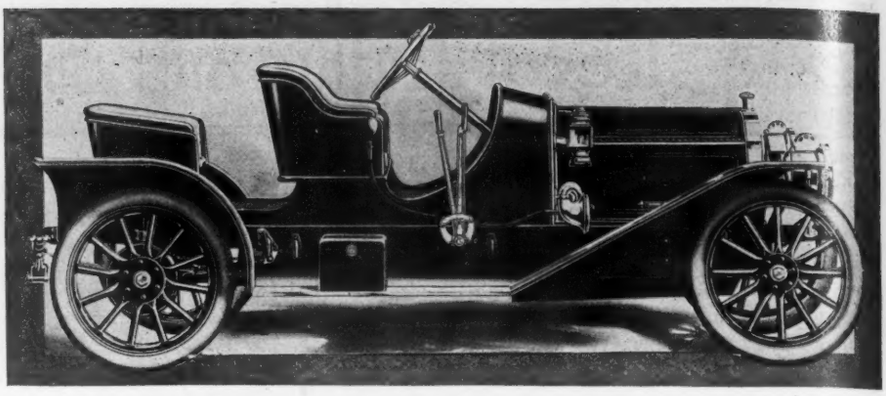


FIG. 1—STERLING THREE-PASSENGER ROADSTER CAR

1910 Sterling Cars Show

WITH a new shop, ample and modern facilities, and a business establishment of wide experience, the Elkhart Motor Car Co., Elkhart, Ind., is crystallizing rapidly and the model O series for 1910 will comprise some six separate styles, including a touring car for five passengers, known as model O-3; a toy tonneau, model O-2, using the same chassis, and model O-1, a roadster.

The several types of bodies are with ash frames, properly joined, well-ironed, and sheet metal is used for panels and doors. Upholstery is in M. B. leather of a careful selection with spring cushions. The standard colors of the finish are red, maroon, and black. The touring car has a wheelbase of 118 inches, standard tread, and uses 34 by 3½-inch Diamond tires, front and rear, with provision for 35 by 4-inch tires as an extra at the option of the purchaser.

The motor, the right side of which is illustrated in Fig. 2, is of the four-cylinder type, placed so that the radiator is over the front axle, and in this way the weight is so suspended between the front and rear axle that the performance of the car is superior. The cylinders are cast separately of gray iron, with spherical domes, valves in heads, and rockers engaging tappet rods, which are actuated by means of integral cams on a single camshaft within the crankcase on the right side, driven by means of an enclosed gear, which meshes with a pinion on the crankshaft.

Carbureter on Right Side

The carbureter C is on the right side of the motor, and the manifold M is of the equalized type, made of aluminum and properly proportioned, having in mind the fact that it is just as easy to exceed the requirement as it is to make the sectional area of the orifices too small. The location of the carbureter is advantageous, being high enough to be accessible, and low enough to afford a hydraulic grade for the gasoline in its course from the nozzle to the cylinders, so that if some of it should fail to vaporize it will drain back to the carbureter, and the mixture will not be unbalanced by excesses of liquid being carried over.

Besides a coil and battery, the latter comprised of dry cells, the Remy magneto is placed on the right side of the motor on the pads P, as shown with the magneto removed, and is driven by a shaft which extends out of the gear housing H, which meshes with the camshaft gear. The ignition system, in view of the character of the devices used and the methods of installation, is up to a fitting standard, and the methods employed for advancing and retarding the spark render the task of obtaining the maximum power from the motor but simply a matter of doing so.

The fan placed between the motor and the radiator, is of great capacity, having strong blades of liberal area, set at a well authenticated angle, and driven by a wide flat belt taking power from the crankshaft through a pulley. The tubular radiator is of adequate area of the cooling surfaces and water is circulated by means of a gear-driven pump of good capacity.

Power of the Motor

The power of the motor, due to the use of 4 by 5-inch cylinders, is large for the weight complete, and is rated by the makers at 30-35 horsepower. The crankshaft has five bearings, with a liberal projected area of each, and the motor delivers its power at about 800 revolutions per minute. Under these conditions, considering the use of Parson's white metal journals, it is a reasonable expectation that the motor will last long and work well. The even rotation of the crankshaft under full load and at low speeds is accounted for in a measure by the well-regulated compression, but the employment of suitable methods of design of the flywheel, considering adequacy of weight, has much to do with the good performance.

The clutch located in the flywheel comprises an extension 10 inches in diameter, machined and ground, and two accurately-ground rings, side by side and expanded by means of a toggle motion press at will against the inner periphery of the ring. There is an entire absence of any facings, and the chances of wear are reduced to a minimum. The toggle motion affords high surface pressures, and the clutch, although it is soft of engagement, is sure, with slipping eliminated excepting at the will of the driver, which under certain conditions is a positive advantage.

From Clutch to Rear Axle

Drive, from the clutch to the rear axle, as shown in Fig. 4, is by means of a shaft within a tube T, on the end of which is a ball-and-socket universal joint U, and between it and the bulge of the live rear axle the gearbox is suspended. This gear-

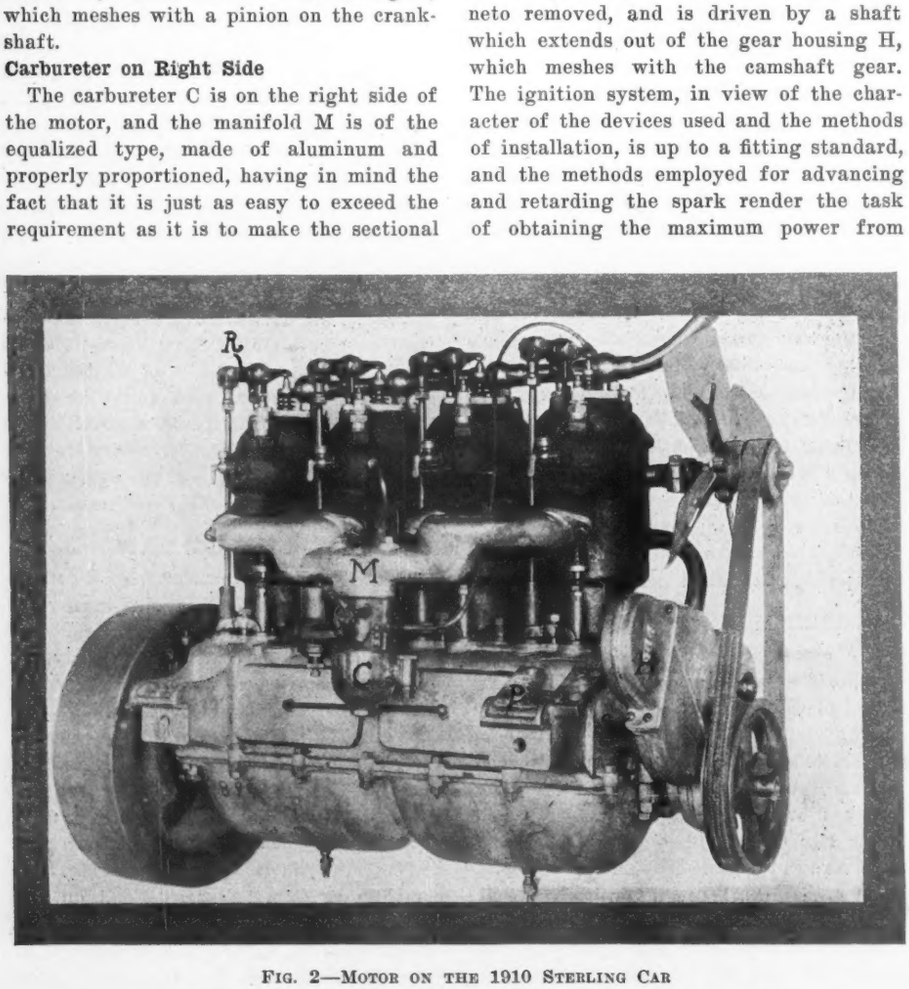


FIG. 2—MOTOR ON THE 1910 STERLING CAR

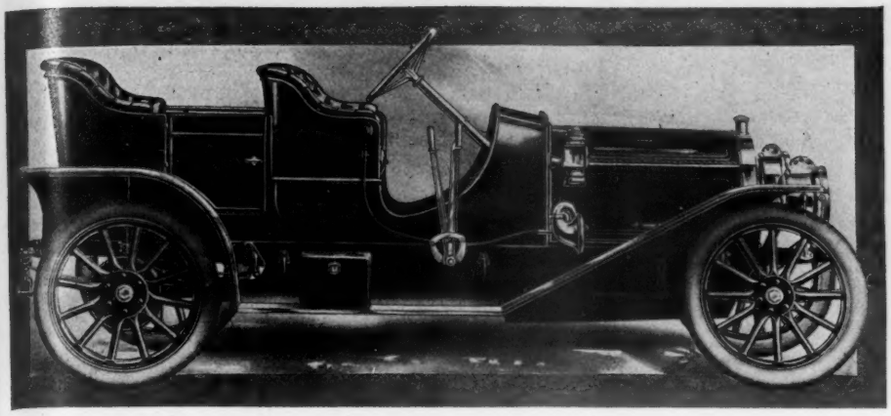


FIG. 3—STERLING TOY TONNEAU FOR 1910

Many of the Latest Improvements

set, designated as the unit type, gives three forward speeds, and the direct as well as the lay shafts revolve on New-Departure ball bearings. The illustration shows the master gears M and M1, the change gears and the lay gear for the reverse, also the sliding sleeves S for direct on high and second, as well as S1 for third and reverse.

The bevel drive, by means of a bevel gear and pinion, is bolted to the differential housing D, and the bevel gear B shows, the cover being off for the purpose. The differential gears are of the bevel type and the case is provided with openings O at four points to facilitate lubrication, one of which may be seen, and one of the differential gears may be spied through the opening. The tubing of the live rear axle is of the usual cold drawn tubing, annealed, and brazed to make-up members of suitable contour.

The control for the brakes extend in, past perches P for the springs, and the levers for applying pressure to the brake-shoes, L and L1, are so placed as to be accessible, and what is equally to the point, out of harm's way. As indicated, there are two sets of brakes, both in drums in the rear wheels, and the control is by pedal and side lever, the latter being for the emergency brakes.

The front axle is of the I section, drop forged from special steel in one piece, and knuckles of good design of the same grade of material assure safety and long life, free from lost motion. In the front wheels the ball bearings are designed for thrust and radial loading, with ⅝-inch balls inside and ½-inch balls outside. In the rear axle, which, by the way, is of the semi-floating type, is provided with Hyatt roller bearings.

Details of Chassis Frame

The chassis frame is a 4-inch channel section, pressed, with 3-inch cross members, and a grade of workmanship to assure the best results. The springs are of special grades of steel, 38 by 2-inch semi-elliptic, front and rear springs are of the platform type, 42 by 2-inch side members and 34 by 2-inch cross members placed at the rear.

In every angle of the large new plant of the makers of the Sterling, quality is indicated, beginning in the forge, in which fine grades of material are whipped into shape, up through the well equipped machine shop, through one inspection after another; unit by unit the work progresses, and in the assembling department, which is large, well-lighted and especially adapted to this class of work, the units combine with the facility of a well-made glove on a shapely hand.

FEATURES OF THE MARMON

(Continued from page 26)

the flange, F2, and is held in place by cap nuts, N1, etc., and the appearance of the wheel is somewhat unusual, due to the elimination of the conventional hub.

The brake drum, D1, is fastened to the wheel spokes, S3, S4, etc., and the drum, of unusual diameter, is also very wide, there being room, side by side, for the two sets of brake-shoes, S5 and S6. The shoes are faced with asbestos fabric, F3 and F4, which is heat-proof and which possesses a high coefficient of friction. The shoes are prevented from dragging by the springs S7 and S8, and when it is desired to apply the brakes it requires but a torsional effort on the brake shaft, S9, or the concentric tube, T. For the other set of brakes, this torsion applied to either set of members will actuate the respective cams, C2 or C3, expanding the bands and applying the necessary pressure to arrest the motion of the car. The brakes are powerful and, all told, the area of contact of brake shoes is close to 352 square inches, and although the area of surface is not the main factor when effectiveness of brakes is to be determined, it is true, nevertheless, that the life of the brakes will depend upon this area of shoe contact.

Passing to the front axle, which is of the I section, with Timken roller bearings, it is at once apparent, even without illustrating the axle, that the designer took account of the enormous side strains to be encountered, and what was regarded as perfectly suited for rear axle work was not necessarily in keeping with the requirements as they have to be met in steering road wheel work. This close study of the several parts and units throughout the car is one of the features to be noticed, and it is believed that the car has been sufficiently illustrated in detail to render the whole situation potent.

The car is fitted with the usual line of bodies, all well suited for the varying demands of the different seasons, with body lines and color schemes harmonizing.

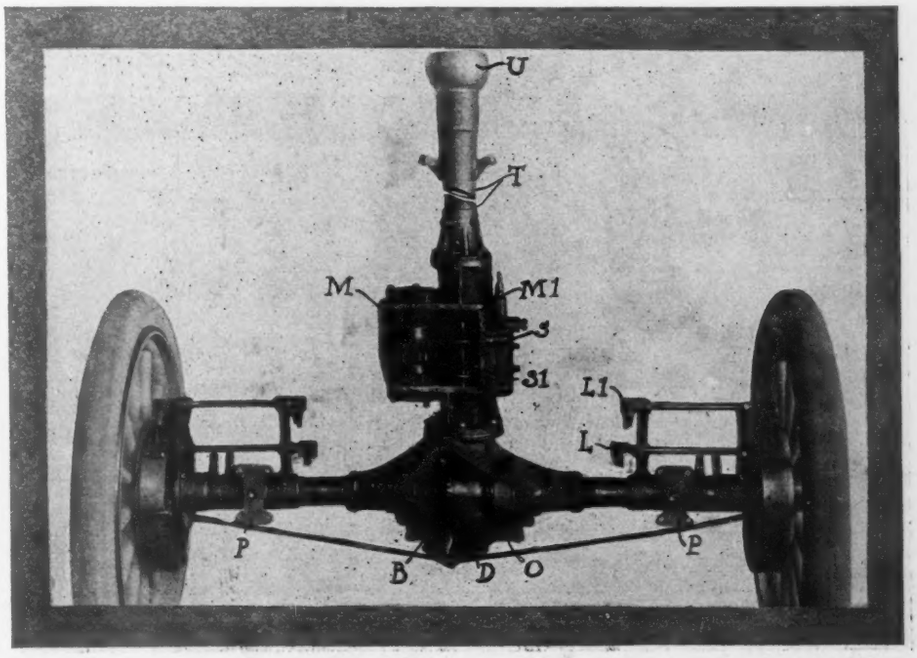
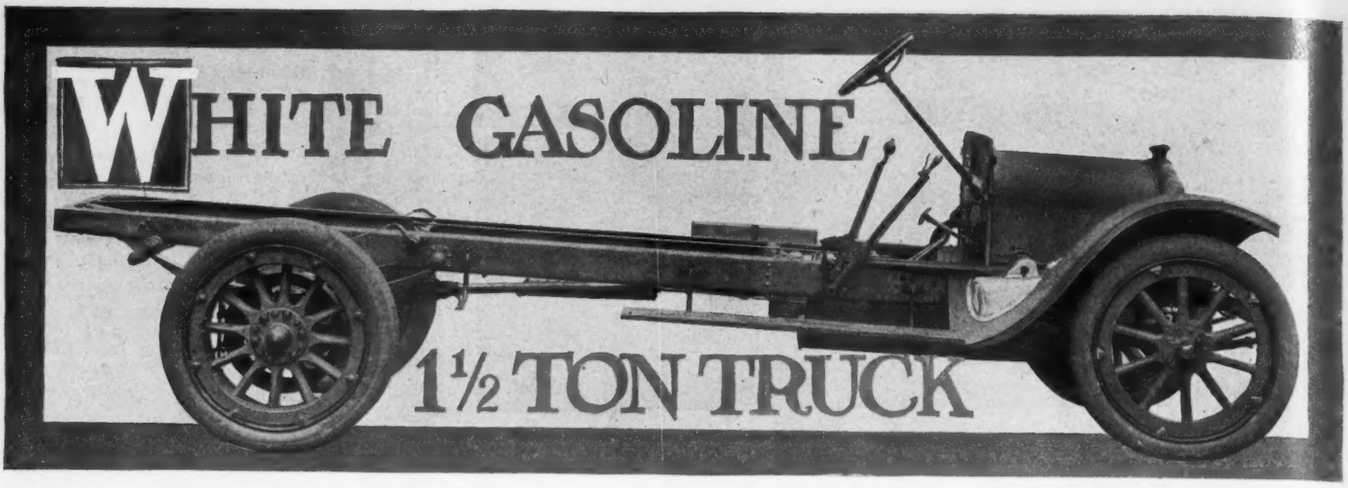


FIG. 4—STERLING REAR AXLE AND GEARBOX

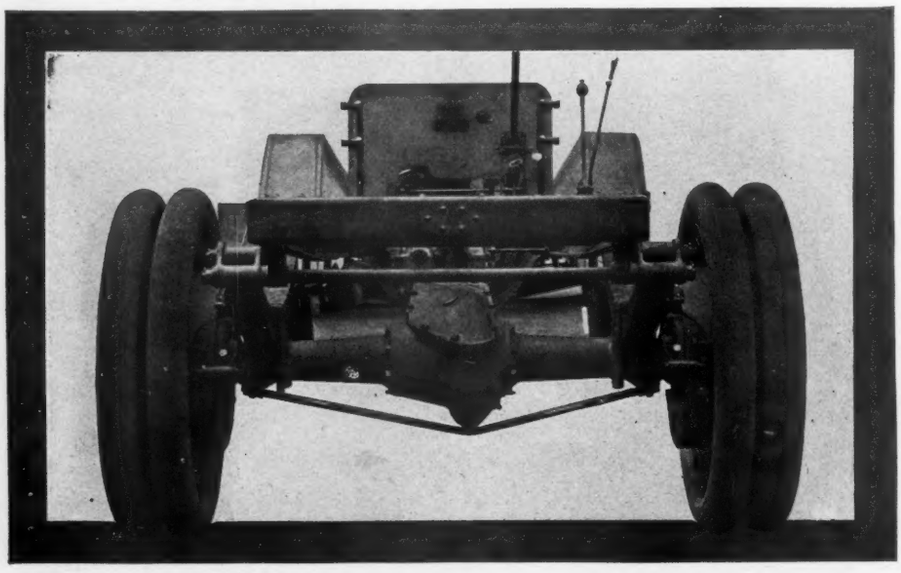


CHASSIS OF WHITE GASOLINE CAR THAT IS USED IN COMMERCIAL WORK

THE White Co., Cleveland, Ohio, has brought out a 1½-ton gasoline truck, in which it uses as the power plant the new four-cylinder White gasoline engine, with 3¾-inch bore and 5⅛-inch stroke. Besides the long stroke, this motor is characterized by having the intake and exhaust passages formed integrally with the one casting forming the four cylinders. It also has the valve springs and stems inclosed. For commercial work this car is fitted with 144-inch wheelbase and uses a particularly stout pressed steel frame construction, which is reënforced at the rear with heavy gusset plates. A semi-elliptic spring suspension is fitted. The rear axle is so located that, with the truck loaded, practically all of the load is supported on the rear wheels, which is claimed to facilitate the steering of the vehicle. A seven to one gear ratio is used on direct drive. The rear wheels carry a pair of 36 by 4-inch pneumatic tires. Single pneumatics are used in front. The rear view of the chassis shows the large braking surface fitted on these trucks. The new White idea is the first time that concern has invaded the commercial field with a gasoline machine. Its efforts heretofore have been confined to the exploitation of cars that derive their motive power from steam, which already are well known commercially.

NEW TAXICAB IDEA

A new type of taxicab is about to be put on the streets of Paris which has a certain general appearance to the electric formerly employed by the New York Transportation Co. The resemblance, however, is only confined to the position of the driver, who, on the Roval taxicabs, is at the back and slightly higher than the top of his cab. Although this is the first time a taxicab of this style has been produced, the idea is not new, this type of chassis having been used for light delivery work for about 2 years. The feature is that the power plant is above or behind the rear axle. It consists of a single-cylinder de Dion-Bouton engine, rated at 9 horsepower, a very compact three-speed transmission and final drive to the rear axle by side chains. The frame is special, being of pressed steel, with a considerable drop to give a low side entrance, and having the driver's platform stamped out with the side members. The closed body is not only larger than can be fitted to the standard type of taxicab, but it is better suspended by reason of its position midway between the two axles. The front portion, usually occupied by the engine, serves as a convenient platform for the carrying of luggage. The company having taken over this venture has decided to put the cabs into operation at the same rate of fares as are charged by the horse-cab drivers, the initial rate being 15 cents for a distance of practically 1,400 yards. After this distance has been covered, the succeeding miles are at a much lower rate. Experience in Paris has been that only the single-cylinder cabs can compete with the horse cabs in price, two and four-cylinder cabs being obliged to charge higher fares.



REAR VIEW OF WHITE GASOLINE TRUCK, SHOWING DUAL PNEUMATIC TIRES

ITALY BUYING ARMY CARS

The general staff of the Italian army is going to discard a great many of its horses and wagons and replace them with motor vehicles. A sum of $12,000,000 has been set aside by the government for the purchasing of 600 motor cars within the next 2 years. All the cars will be commercial vehicles and half are to be able to carry a net load of from 1 to 1½ tons and the other half are to be vehicles with a load capacity of at least 2½ tons. It will be required that the cars when fully loaded be able to average 9.3 miles an hour and climb hills having up to 15 per cent gradient. Furthermore, the cars must be provided with fuel tanks enabling them to run at least 125 miles without having to stop to take on a new supply.

LONDON FARES REDUCED

The question of transportation in London with its vast unit of population and its extensive area possesses peculiar significance, which leads Consul-General John L. Griffiths to note some of the methods now in vogue, in a communication to the federal organ, the Daily Consular and Trade Reports, as follows:

With the advent of the public motor car,

which starts with an initial charge of 16 cents to cover roughly 1 mile of travel, the hansom cab, for a very long time the popular means of reaching a destination, has been less and less used. To meet the new competition 2,000 hansom cabs and four-wheelers—the number, it is stated, will be increased very shortly—have been placed on the London streets in which two persons can travel a mile for 12 cents. The reduction in fare promises, to a certain extent, to revive the use of the hansom cab, although the greater speed of the motor car is decidedly in its favor. The interesting fact is that hansom cabs and four-wheelers can be operated profitably for the very low fare of 12 cents a mile.

Nothing impresses the American abroad more than the disparity in the charges for cabs and carriages in his own and foreign countries. Low fare greatly multiplies the use, and so profit is possible. To show how common is the use of motor cabs, a paragraph appeared recently in one of the London papers stating that 1,500 experienced chauffeurs were required to run new public motor cars that were necessitated by the demands of traffic. Another feature of transportation in London to which attention can well be called is the practice of designating by a number the route of an omnibus. The number consists of large numerals conspicuously displayed above the driver's seat, and at the rear of the omnibus. The advantages of this simple mode of designation are quite evident.

In American cities of considerable size there is frequently some central junction point which practically all the street cars pass. At certain hours in the morning and evening they pass in very great numbers and there is more or less anxiety and confusion in trying to determine which is the car one desires to take. There may be several streets or places mentioned on the same car, and this may prove misleading. The uncertainty increases late at night as the traveler tries to remember the car he wishes to use. In the London system, all omnibuses traversing the same route use the same number, and it is the number almost inevitably that is mentioned when one asks which omnibus goes to a certain place. Might not the same system be adopted to very great advantage in American cities?

MALDEN AFTER FIRE TRUCK

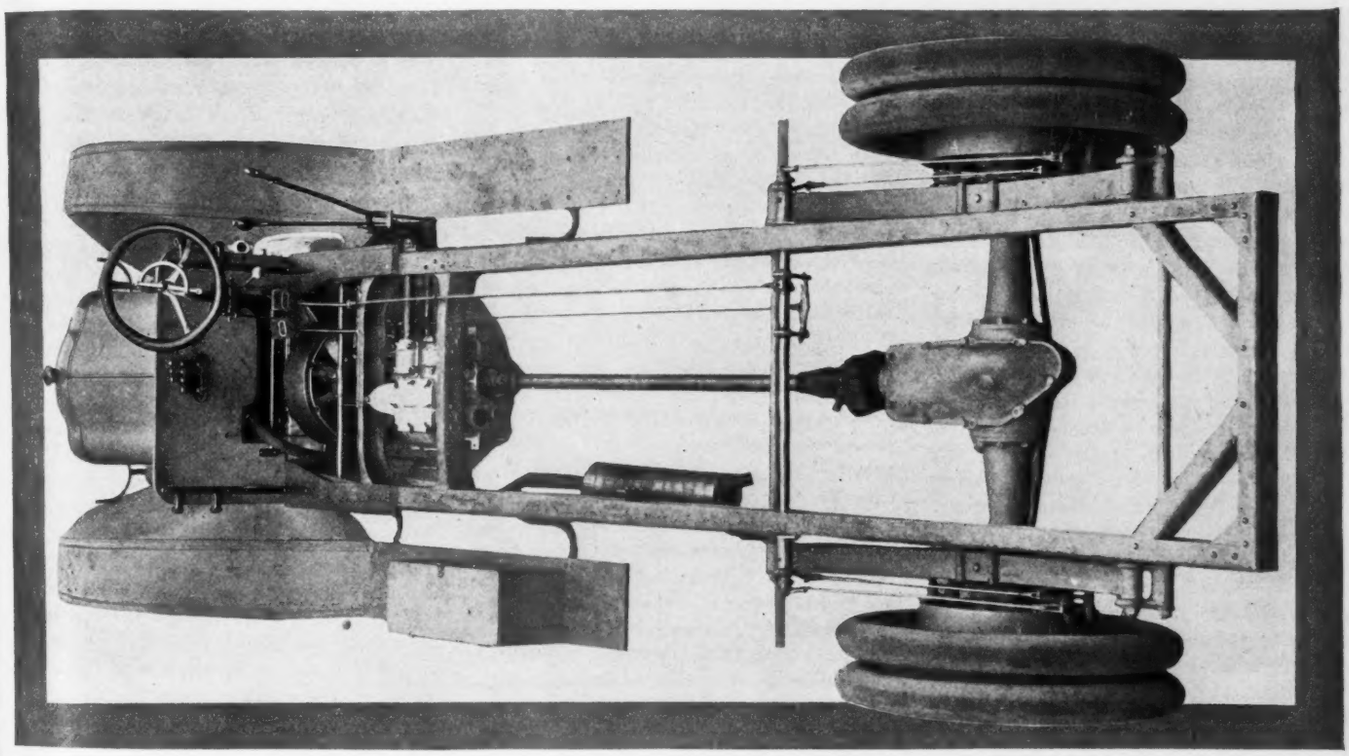
The city council of Malden, Mass., has appropriated $5,000 to be used to purchase a motor fire truck that will be installed in the central fire station. Worcester, Springfield, Brockton, Brookline and Hull are five Bay State cities and towns that have added motor fire vehicles to their fire department.

STATUS OF TAXICABS

The status of a taxicab is going to be determined by James C. Goldman, a Bostonian, who is willing to go to law to learn whether it comes under the head of carriages. The Massachusetts supreme court will decide the case unless Goldman cares to go higher up than that tribunal. Last August Goldman was in court for hiring a taxicab and was fined $15. He appealed and the case was taken to the superior court. The prosecution was made under the revised laws, which read, "whoever hires a horse or carriage with intent to cheat or defraud the owner, etc." The case was submitted to Judge Wait upon an agreed statement of facts. He ruled that, although the statute in question was passed in 1882, before the general use of motor cars and taxicabs, it was broad enough to cover them. He instructed the jury to bring in a verdict of guilty. The court granted a stay of sentence in or to enable Goldman to appeal to the supreme court on the question as to whether the statute covers taxicabs.

DANES ARE CONVERTED

For more than 10 years there has been a systematic opposition on the part of high government officials and even representatives of the people in Denmark against the introduction of motor cars in replacement of horses and wagons in the government departments. About 18 months ago the main postoffice of the city of Copenhagen was revolutionized when for the first time in its history a mechanically-propelled machine was put into use. It was a motor cycle and only after it had been in service about 6 to 7 months was it accepted by the postal authorities. This motor cycle was used to carry only important documents to railroad stations. As it gave full satisfaction it was decided to also try a motor car into the service. After 3 months' trial the car was bought and since then two more cars of the same make have been added to the service. These cars are used to carry the mails to the various depots, which all are far away from the main postoffice. So far they have served their purpose well.



LOOKING DOWN ON CHASSIS OF WHITE 1½-TON GASOLINE TRUCK

QUESTION OF RIGHT OR LEFT-HAND THREADS

By M. E. Wells

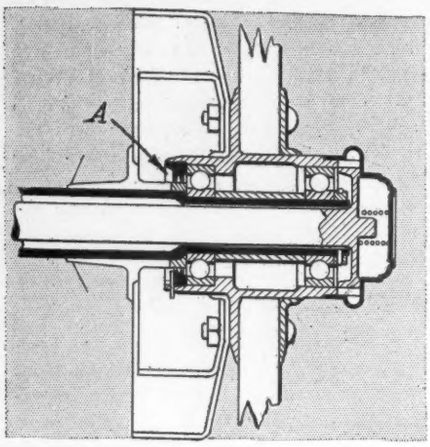


FIG. 1

THAT there should be any doubt as to the choice between right and left-hand threads when designing any piece of machinery seems almost ridiculous. That the question is not so easily settled as one might think, and that it is sometimes settled in the wrong way can be seen by making a close examination of some of the 1910 cars which are appearing on the market at the present time. It seems somewhat surprising, too, that many of the faults which were more or less generally known and corrected during the past season should be cropping out in next season's output. In order that the reader may convince himself that the solution of the problem is not so easy as he may think, it is suggested that he stop after reading the conditions in each of the following cases and, before reading further, definitely decide which thread he would choose.

For the first case, consider the nut or ring A, Fig. 1, which prevents end motion at the inner end of the right-hand wheel of a motor car. Doubtless there will be three answers—in other words all possible answers—given. One will advise the use of a right-hand thread, arguing that the friction of the bearing will tend to hold back the outer race and consequently cause it to revolve at a slightly slower speed than the wheel. If this be the case, the friction between the outer race and the ring A would, if a right-hand thread were used, continually tend to tighten the ring in the hub as desired.

Another Reason Given

Another would say that the friction between the outer race and the parts of the wheel hub would be so great that the race would never move with respect to the wheel. If this be the case, either a right or left-hand thread could be used with entire satisfaction, but since the right-hand thread is standard, it should be chosen. That neither of the above methods of reasoning is correct has been shown in practice. At least one prominent concern has, to the writer's knowledge, found that in a number of cases where no lock was

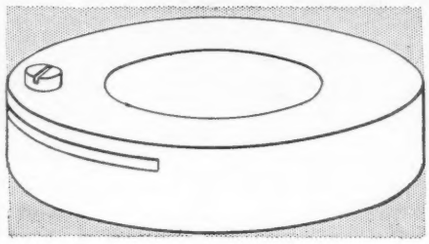


FIG. 2

furnished the ring in question would refuse to stay tight and it eventually was forced to send out positive locking devices to be placed upon all the cars which they then had in the field.

A study of Fig. 3 probably will make the reason for this action clear. Looking toward the inner end of the right wheel hub after the locking ring has been removed, let B represent the wheel hub, C the outer race of the bearing and D the stationary inner race or cone. For the sake of clearness, considerable clearance has been shown between the race and hub. It will be seen that the weight of the vehicle will cause the bearing race to be held tightly against the lower portion of the hub and even though the bearing was a fairly snug fit in the hub when first put in, it eventually may flatten out the roughness of the original machined surface until, with a heavy load upon the bearings, the pressure and consequently the friction between the upper portions of the hub and bearing becomes zero and we have the case as exaggerated in Fig. 3. Here we find that the outer race C turns to the left as does the wheel hub. The circumferential speed of both is the same since they are in contact and as the circumference of the race C is shorter by a small amount than that of the wheel hub B it is apparent that the race will revolve slightly faster than the hub. The exact ratio of speeds would of course depend upon the relative diameters or circumferences. In actual practice, this difference of speed will be almost infinitely small at first, but as the motion continues, the retaining ring is loosened—assuming a right-hand thread to be used—allowing freer motion with more wear and so the conditions continue to grow worse and worse. If the ring were

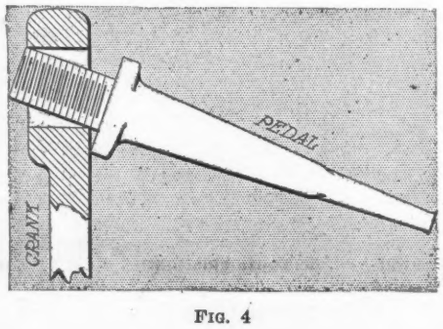


FIG. 4

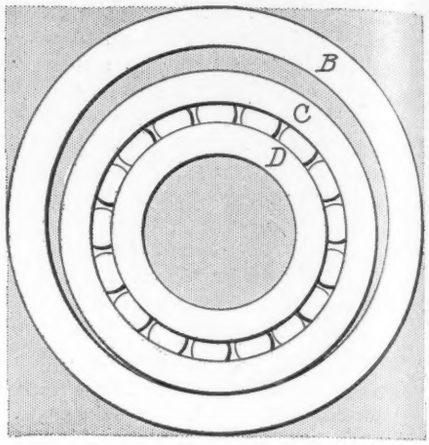


FIG. 3

made with a left-hand thread, it would of course tend to tighten and thus prevent any further motion of race C.

Inconvenience Might Ensue

A left-hand thread upon one wheel only would, however, mean that they would no longer be interchangeable, thus leading to considerable inconvenience. For this reason, most designers prefer to use a right-hand thread on all wheels and provide a locking pin or other positive means to prevent loosening of the ring and bearing. There are 1910 cars now on the market where the right-hand thread is used at this point, but no means whatever are provided to prevent loosening. It may be some weeks before the makers begin to hear complaints from this source, but the writer nevertheless expects them to make themselves evident in time. That the strain or shearing stress upon the locking pin or device is considerable, is shown by the experience of one concern who used a split ring as shown in Fig. 2 but found that it failed to hold even though the screw for spreading the threads was well tightened.

Another case quite similar to the above is where the spindle of the right-hand bicycle pedal screws into the crank. Doubtless many who have owned wheels for years cannot say whether there is a right or left-hand thread at this point. The writer remembers at least one make of bicycle which was manufactured in Chicago a number of years ago, on which the right-hand spindle had a left-hand thread and the left-hand spindle had a right-hand thread. If both sides had been supplied with right-hand threads, the designer might have contended that he counted upon always having a tight-fitting thread, but the mere fact that he used both threads and placed them both on the wrong side shows that he did not understand the action which tends to loosen the spindles.

Another Example

If there are still any readers who do not see the reason for putting right-hand thread upon the right side and left-hand

upon the left, let them consider Fig. 4 where a spindle having a loose thread is shown greatly exaggerated. When pushing upon the pedal, it will be seen that the pressure between the spindle and the crank comes only at two opposite points. We thus have another case of a circle rolling inside of a slightly larger one and thus causing a small difference between the rates at which the two rotate. The direction of rotation will be evident after a moment's consideration of the two cases.

As a third illustration, the writer recalls the design of a centrifugal water pump which was used upon a very prominent and high-priced car several years ago. Fig. 5 shows the general layout of the pumpshaft, etc., with the driving gear on the right and the dog for driving the magneto on the left. The shaft was short and the designer allowed the stuffing glands A to act as bearings. He also evidently intended that they would tend to turn in the same direction as the shaft and therefore provided right and left-hand threads on the nuts B with the idea that the nuts would automatically tighten the glands until the friction between the nut, gland and packing would be greater than that between the gland and shaft, thus preventing further rotation of the gland but continually assuring a water-tight stuffing box.

Looks Nice On Paper

This looked nice upon paper, but in practice it was found that in the majority of cases, the shaft assumed a sort of wobbling motion which caused the glands to roll—not slip—around the slightly larger stuffing box in a manner quite similar to the first two cases mentioned. Although the gland as a whole traveled about the stuffing box center in the same direction that the shaft revolved, a little study of the previous diagrams will show that it rotated about its own center in a direction opposite to that of the shaft, thus defeating the designer's intentions, continually loosening the glands and causing a leaky joint at all times. As a remedy, a pin was inserted in a slot so as to allow end motion but prevent rotation of the gland. This, of course, prevented the loosening effect, but made it necessary to tighten the gland by hand occasionally instead of its being automatic in action as originally intended.

HOME FOR CHAUFFEURS

St. Louis, Mo., Nov. 26—The St. Louis Auto Drivers' Club, which comprises the best class of chauffeurs, has perfected a permanent organization and engaged headquarters at 4635 Delmar boulevard. The rooms are being converted into modest though comfortable club quarters and plenty of motor literature will be supplied to members. The club will erect throughout the county signs warning motorists against exceeding the speed laws; also pointing out dangerous spots.

Bay State Motoring Veteran Suggests Good Road Laws

Dr. Joseph C. Stedman, one of the first owners and drivers of a motor car in Boston, has been making a thorough study of the problem leading up to accidents, and he has compiled a set of rules designed to prevent accidents, if carried out carefully. In his suggestions he admits that some of them are not original with him, and that motorists will say, "Why, yes; this is simply repeating what we all know." But the trouble is that they disregard them. Dr. Stedman's suggestions are more elaborate than any set heretofore compiled, and they are worth remembering by all motorists. Here are the suggestions, just thirty in all:

1—Do not pass any moving vehicle going the same way, or standing still, facing the same way, without giving proper warning.

2—Do not pass any moving vehicle going the same way on the right, even if there is room; always pass on the left.

3—Do not cross intersecting roads without slowing down and sounding the horn.

4—Do not cross from right to left to turn into another street without looking back, and if anyone is following, hold up the hand.

5—Never cut a corner or curve under any circumstances, but always keep to the right of the road and blow the horn. This should apply to all curves, whether the view is obstructed or not.

6—Do not pass a vehicle going in the same direction around a curve or corner. Wait until the view is unobstructed, as someone may be coming from the other direction.

7—Do not slow up quickly or stop without looking back and giving warning by holding up the hand.

8—Do not pass an electric trolley car standing still without slowing up or coming to a stop and giving warning. If compelled to pass to the left of an electric car, standing still or in motion, be sure the view is unobstructed.

9—Always use great caution going through inhabited districts.

10—Do not run fast on slippery or sandy roads, because the car cannot be easily controlled, even in the hands of the most expert driver.

11—Do not follow another fast-moving vehicle in a cloud of dust or try to pass it unless the view is unobstructed, as someone may be coming from the opposite direction.

12—Do not run fast in a fog for the same reason.

13—Do not run fast at night as if you were the only one out.

14—Do not hold the middle of the road if another vehicle is trying to pass you. Keep to the right.

15—Never run away in case of collision or accident. It is cowardly and inhuman.

16—Never leave the motor car on the hill unattended, even with the brakes on, without turning the front wheels to the curbstone. The brake may be released accidentally or by mischievous boys.

17—Never run a motor car after taking a drink of any alcoholic beverage; it is more than unjust to others; it is a crime.

18—Do not run fast on narrow highways where it is difficult to turn out for another vehicle.

19—Never approach another vehicle on a narrow highway without slowing down. Remember that horses drawing heavy loads require more time to get out of the way and cannot do so quickly. Give them a chance and do not curse the driver.

20—Always offer help if anyone is in trouble on the road; you may need it yourself some day.

21—Do not think that all that is necessary to do is to blow the horn to warn others; slow down to see if they hear or see you. They may be deaf or frightened and may do the wrong thing. Bear in mind that the foot traveler, even if he is not on a crosswalk, has the right to use the street and is not obliged to get out of your way. Your full duty is not performed when you blow your horn or other device for signalling; it is your legal duty to avoid touching the pedestrian. This sometimes can only be accomplished, particularly if the pedestrian is old or infirm, or a child, by bringing your motor car to a full stop.

22—Always run slowly near a sidewalk and never pass anyone whose back is to the street without giving warning, as the person may step backwards in front of the motor car.

23—Do not pass any moving vehicle going the same way and then turn in front of it immediately. Allow time before turning to right of road again.

24—Never turn around on a public thoroughfare without looking to see if anyone is approaching or is in the way.

25—When turning do so from right to left, never from left to right.

26—Slow down if a vehicle is turning around and keep to the rear.

27—Whenever there is a doubt as regards the right of way, let the other fellow have it.

28—Everyone has the same rights on the public roads; always respect them and give them the same courteous treatment you expect in return.

29—Never take any chances, for it doesn't pay.

30—Always keep your brains and heart at work for the good of others and so of your own. If you lack either brains or heart it is a positive crime against humanity for you to run a motor car.

ST. LOUIS SHOW PLANS

St. Louis, Mo., Nov. 27—The show committee of the St. Louis Manufacturers and Dealers' Association has mailed out plats of the floor space at the First Regiment armory, where the St. Louis show is to be held February 14 to 19, inclusive. The plats show that there are 13,800 square feet for sale on the main floor and 11,500 square feet in the fourteen company rooms. Application blanks for space are enclosed with the plats. The preferred location of the prospective exhibitor must be returned to Manager Robert E. Lee not later than December 15 if the applicant wishes to participate in the first allotment. Members of the association will take equal chances in this allotment and whatever space is then left will be apportioned to late applicants and to non-members. An elaborate scheme of decoration which will be supplemented by handsome pedestal signs is being worked out. The main floor spaces will be sold at 70 cents the square foot and the space in the company rooms will cost 60 cents the square foot. Some of the company rooms will hold eight cars.

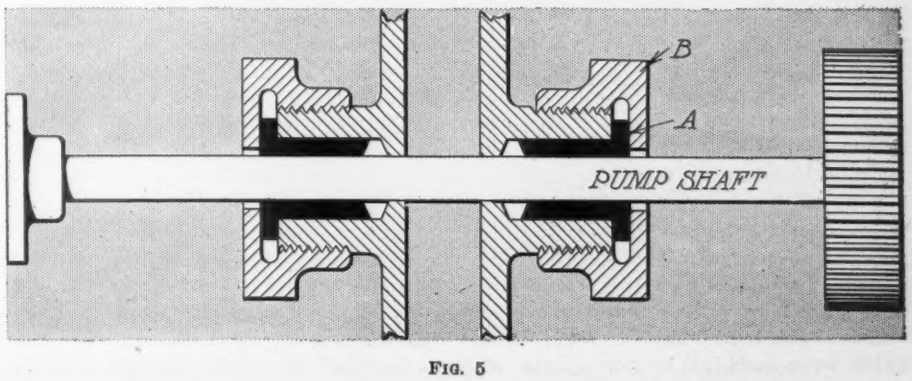


FIG. 5

From the Four Winds

N S E W

Rice Will Race—R. P. Rice, manager of the Seattle branch of the Ford Motor Car Co., will become a transcontinental racing driver next year in the second annual New York-Seattle race, promoted by M. Robert Guggenheim.

Army Wants Highways—General Marshall, chief engineer of the army, in a recent report recommended that $125,000 be appropriated for the improvement of the military road to Mount Tacoma and $120,000 for roadways in the vicinity of Puget sound.

Show for Grand Forks—Grand Forks, N. D., is to have the first show in its history when the implement men for North Dakota and northwestern Minnesota meet for their annual convention the first week in February. It was decided to have a motor show at a meeting of the implement dealers of the city, when committees in charge of the convention also were named.

Working for Good Roads—The Franklin County Automobile Association, of Greensfield, Mass., has been organized, starting with a membership of 100. The principal work of the new club will be looking out for the improvement of the roads throughout Franklin county. Rev. C. W. Merriam is to be the president, Dr. J. C. O'Brien vice-president, Dr. E. L. Major secretary, and A. B. Allen treasurer.

After Car Thieves—Due to the fact that the car thieves are becoming active in Denver, the Denver Motor Club has again started its campaign, which will probably put an end to the joy riders who have been stealing cars. In addition to offering a $100 reward for the arrest and conviction of any thief who steals a member's car the club also will prosecute to the limit any one who steals tires, lamps, robes, tools or anything whatsoever from the car of any of their members.

New Sign Board Scheme—At a meeting of the thirty-one clubs affiliated with the Minnesota State Automobile Association the question of the most profitable distribution of about 600 sign posts in various parts of the state along main traveled thoroughfares was discussed. The association has sufficient funds on hand to pay for these and a method will be devised for their disposition among clubs where the best result will accrue from the expenditure. It is probable that about twenty of the posts will be placed in the hands of each of the thirty-one clubs belonging to the state association and that they in turn will place them at the disposal of the various county road commissioners. Past experience has proved that signs placed by various motoring organizations have been removed, while those which were installed by the county officials were not molested. The sign posts are to be placed in remote parts of the state with which members are more or less unfamiliar, so they will participate in the good to be derived from them.

Popular Road Repaired—The roadway leading to the popular summer resort at Seaside, Ore., has been greatly improved recently by the placing of coarse rock on the county road between Seaside and Elk Creek and that highway is now in condition for travel at all seasons of the year.

Delinquents Are Arrested—Failure to renew their state licenses for 1909 caused forty Seattle motorists, including two millionaires, to be arrested. The list of delinquent owners in King county first placed at 150 proved to be ten times as great, and the complete report from the secretary of state to the sheriff shows 1,500 names. It is expected that more arrests will be made at any time unless the licenses are paid.

Building Great White Way—The Great White Way, a $2,500,000 motor-trolley-roadway promoted by the Chicago-Milwaukee Road and Realty Co., is receiving considerable attention in Milwaukee. The roadway would make an ideal speedway for races of any distance from 1 to 90 miles, the distance between Milwaukee and Chicago. The project would take 2 years' time to complete. There would be separate divisions for motor cars, horses, pedestrians and trolley cars.

Omaha Needs City Cars—"The longer I hold public office the more I am convinced it would be good public policy for the city to provide its officials with motor cars," says Mayor Dahlman, of Omaha, Neb. "We claim to be metropolitan and we have the goods to show, but when it comes to entertaining visitors and showing them around, we have to go down into our pockets for motor hire, which would be eliminated if the city provided a certain number of its officials with cars. This is only one feature of the saving which such a course would effect."

Kansas City Breach Widens—The breach between the two warring factions of dealers in Kansas City, Mo., was enlarged at a meeting of the Kansas City Motor Dealers' Association when the promotion of a show was enthusiastically endorsed. It also was decided to retain the old date, the week of February 28, and the old place, Convention hall. The exhibition of the sixteen seceding motor firms, organized into the Motor Trade Association, also will be given in Convention hall the week of January 17. The resignation of the sixteen companies from the Kansas City Motor Dealers' Association brought about a vacancy in every office in the organization. These new officers were elected: George A. Bond, president; J. R. Histed, vice-president; E. G. Anderson, secretary, and H. G. Kirkland, treasurer.

Finishing Canyon Road—The residents of Bristol, Wash., have recently subscribed sufficient funds to finish the canyon road to the Columbia river by way of the Bristol cut-off, and the road to Pine Flat and Snowden will be surveyed shortly.

Nebraska After Fees—Secretary of State Junkin is planning to arrest Nebraska owners who are delinquent in the $1 license fee. He has sent out notices to the sheriffs of the state to arrest the offenders. A penalty of $25 is provided. A large number of licenses have already been cancelled for non-payment of fees.

Putting Up Signs—Members of the Wisconsin State A. A. resident in Rock and Walworth counties, Wis., had occasion last week to assist a committee from the Chicago Motor Club in laying out a route and erecting signs for a loop from Chicago through northern Illinois and southern Wisconsin. The committee consisted of F. H. Moran, J. Clare and J. T. Elmore, who used a Randolph truck for covering the territory. These counties are being pushed forward as having an excellent framework for a Cobe trophy race course, being near Chicago as well as within striking distance of Milwaukee.

Nashville Needs a Club—A movement is on foot to organize a motor club in Nashville, Tenn., and it is probable that it will be successful, as there are several matters that need looking after by an organization of this kind. First and foremost is the road question. The roads around Nashville are unusually good but there are some neglected places and an organization to push things could get these fixed up. The dust problem is one of more concern in this immediate section. Last but not least a country club house or two 10 or 12 miles out, where refreshments could be obtained, would be worth while.

Will Plank Highway—A fight for good roads throughout the county is one of the main purposes of the Coos Bay Automobile Club of Oregon, which recently was organized at Marshfield, Ore. The following are the officers of the new club: President, Attorney C. R. Peck; vice-president, J. E. Schilling; secretary, L. R. Tower; treasurer, Chester W. Wolcott. Two years ago there was but one machine in the city of Marshfield. One of the first steps toward securing good roads in that vicinity will be the planking of the highway between Marshfield and North Bend. The club also expects to soon begin work on the road between Coos Bay and Co-

quille City, and a road from Eastside to Sumner, in addition to the newly completed road to Roseburg.

See Need of Roads—The Good Roads Association of North Yakima, Wash., will take immediate action toward improving the roadways about that city. The citizens of that city claim they are suffering a loss of $1,000,000 annually on account of the bad condition of the roads.

Another Savannah Jaunt—The next run of the Savannah Automobile Club will probably be to Jacksonville, Fla. The Savannah News will be asked to take part in the affair, as will the Jacksonville Automobile Club and a local paper there. This run if made would blaze out the remaining link of the proposed highway from New York to Jacksonville, passing through Savannah. The run if held will be in the latter part of April or the first of May. The distance is something like 162 miles.

Van Sicklen Withdraws—The Chicago Motor Club's annual election will be held next Tuesday night and while there are two sets of nominees, ticket No. 2 is without a head, N. H. Van Sicklen, named for the position of president, having withdrawn in favor of David Beecroft, who is on No. 1 ticket. Mr. Van Sicklen declares he greatly appreciates the honor conferred upon him, but he believes Mr. Beecroft is entitled to the position because of his work in the past in advancing the interests of the club.

Washington Show—It has been decided to hold a show during the week beginning January 24. Officers elected are as follows: Chairman, W. C. Long, of the Commercial Auto and Supply Co.; secretary, John S. Larcombe, Jr., Motor Sales Co.; treasurer, John R. Thomas, John R. Thomas Automobile Co. Chairman Long was authorized to appoint five dealers as a board of directors by whom the show will be run. The manager of the show will be B. R. Johnson, who promoted several shows in Baltimore. Convention hall, one of the largest buildings in this section, has been secured. Unlike any previous show held in Washington the decorations and signs will be uniform.

George Odenbrett Killed—George L. Odenbrett, junior member of the firm of Bates Odenbrett Automobile Co., of Milwaukee, Wisconsin agent for the Buick and Winton, was killed by the explosion of an acetylene tank in the depot of the Gas Tank Recharging Co., 961 North Water street, on Monday noon. The building was totally wrecked, and John Christoples, a chauffeur, and R. B. Neye, bookkeeper, were burned and cut. Mr. Odenbrett was owner of the recharging company, with John Heber as associate. With Neye and Christoples he was tinkering with a generating tank 10 feet high and 30 inches in diameter. The pressure gauge showed between 130 and 160 pounds at the time. Mr. Oldenbrett was widely known as the first owner of a self-propelled vehicle in Wisconsin—a Winton—which was exhibited at state and county fairs as an object of curiosity a decade or more ago.

Find Ores of Vanadium—Deposits of ores of vanadium, one of the rare metals, occur at several places in the western part of the United States, according to a recent report of the United States geological survey, but none of these was mined in 1908, although 300 tons of vanadium ore was imported into this country from Peru during the year.

Bausch's Car Winner—A motor parade was one of the events during the industrial exposition held in Rochester, N. Y. A 1909 Pierce-Arrow touring car, owned by William Bausch, of the Bausch & Lomb Optical Co., Rochester, was decorated by J. B. Keller Sons, florists, who used for this purpose 1,200 yards of smilax, 4,000 carnations, 1,200 chrysanthemums and 1,600 roses. It won the main prize.

Hard Job for Cadillac—The premier of Australia has designated a Cadillac 30 for one of the most difficult tasks ever assigned to a motor car—the exploration of the proposed route of the Australian transcontinental railway. The proposed route for hundreds of miles lies through trackless wilderness. It will be necessary to complete the stupendous undertaking for the car to carry all the essentials for living in the desert.

Death of W. F. Fuller—William F. Fuller, president of the Connecticut Automobile Association and former president of the Automobile Club of Hartford, died at his home in Hartford Saturday after a lingering illness from heart trouble. Mr. Fuller was taken ill last May and slowly weakened until the end. He was president of the Automobile Club of Hartford for two terms and held that office until the last annual election, when he stepped down in favor of General Wallace T. Fenn. He was re-elected president of the Connecticut Automobile Association, the state body, at the last annual election. Mr. Fuller is survived by his wife and two children. He was engaged in the leaf tobacco business under the firm name of E. A. & W. F. Fuller.

Another Mountain Road—A road similar to the one to Mount Tacoma is now being constructed to the snow line of Mount Baker, in Oregon. The citizens of Deming, Ore., have raised a large subscription which will be expended on the road.

Long Island Club Candidates—Allen C. Alderman is being considered for the post of president of the Long Island Automobile Club in place of F. G. Webb. L. T. Weiss is to be vice-president, C. C. Cluff treasurer and C. S. Cavanagh secretary.

Will Raffle Space—Will F. Lippman, secretary of the Portland Automobile Club, of Portland, Ore, is active in formulating plans for the show during the week of January 24 at the armory. In order to maintain harmony in the matter of allotment of space to exhibitors a novel plan will be pursued, it being decided to raffle off the space by the grab-bag method.

Brick Surface Nearly Done—It is expected that the brick surface on the Indianapolis motor speedway will be completed during the coming week and that the course will be in fine shape for the race meet next month. A concrete wall 3 feet high and 12 inches thick has been built around the course and it is believed this will prevent cars from leaving the track.

Savannah Winners—The winners in the Savannah to Atlanta endurance have been announced by Arthur W. Solomon, chairman of the technical committee. In class A, cars listing at $2,000 and over, Dr. Craig Barrow, driving a 24-horsepower Stevens-Duryea, made the trip with a perfect score and was awarded first prize. In class B two cars are tied—a 30-horsepower Crawford, driven by W. C. Mahoney and a Maxwell 30, driven by Robert Brockett, Jr. The prize in this class will be divided. In class C there is another tie—a Maxwell 10, driven by E. G. Gager, and a 22-horsepower Buick, driven by E. A. Weil.

WILLIAM BAUSCH'S PRIZE-WINNING PIERCE-ARROW IN ROCHESTER PARADE

Manufacturers' Communications

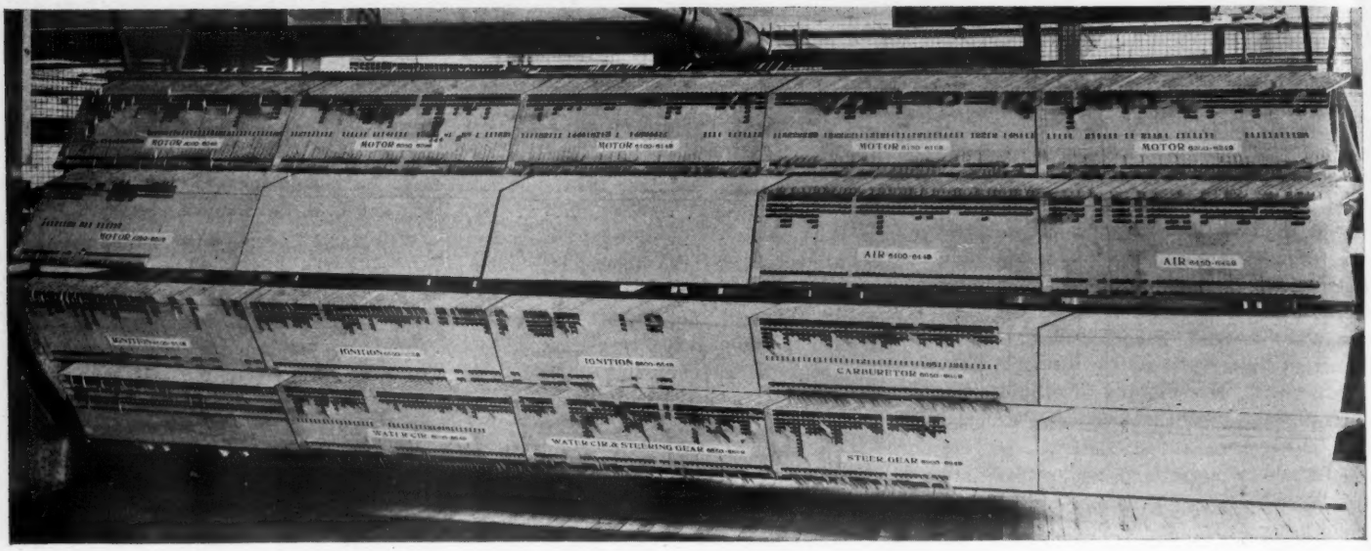


FIG. 1—PART OF ROYAL TOURIST'S SYSTEM OF FACTORY BOOKKEEPING

CLEVELAND, O.—Editor Motor Age—There is used in our factory a unique and accurate method of keeping close touch on not only the amount of stock on hand in the factory, but also the different stages in the processes of manufacture of all the parts entering into the makeup of the car. This system of bookkeeping is illustrated in Figs. 1 and 2. Fig. 1 shows an immense hexagon roller or drain 10 or 12 feet long and on the six sides of which are enumerated in respective rectangles the different parts of the car. This big hexagon can be rotated so all six sides are used. Fig. 2 illustrates one rectangle which is for keeping track of the transmission materials. It will be noted that each vertical line on this, as well as on any other section of the hexagon, represents a part of the car, and it will be noticed at the top of each vertical line the number of the part as well as its name. The figures running down on the left from 1 to 12 represent the different operations through which each part goes in the shop. As each piece, for example, entering into the transmission has a different number of operations to go through, only that number of metal clips are on the line representing that piece; also each card has the different operations that the particular piece goes through. One of these cards is illustrated in Fig. 3, showing the number of the piece to be 6004, and that it has eight successive operations, the first being heat treatment, the second on the Gridley automatic, the third on the drill press, the fourth is a water test and the remainder are shown on the card.

The first line of clips represents "no material" as shown at the extreme left, Fig. 2. In Fig. 2 there is one card secured in this row, signifying that there is no material on for that particular part, which is the front end cap for the transmission case. In starting a new lot of cards through the factory all cards are placed in this row until the store room reports material on hand. The cards left in this row remain until the receiving clerk reports that the material has been received. With material received the cards are moved to the second row, which is "Waiting for Tools," where they remain until all tools, jigs, drawings, etc., are available and the machine shop, or whatever department does the work on it, is ready to put it through.

As soon as the parts start through the factory, the card is removed to row No. 1, indicating that it is being drilled, heat-treated, or whatever comprises its first operation. Where there is only one clip on the vertical operation line it shows that that piece is only inspected and purchased outside. The last or bottom clip on horizontal lines always means inspection, this being the last operation through which the piece goes. When the card is next to the bottom line of clips, it denotes that the part is purchased or partially machined outside. This line and the topmost line are the two over which the purchasing agent gets nervous, as they indicate that he is delaying the manufacture as long as the cards remain in these rows. The bottom line in each section is the stock room line and when a card is in that line it indicates that the piece is finished and in stock ready for assembling. Three or four lots can be taken care of at one time on this hexagon wheel by the use of different colored cards, red cards being used for one lot, blue for another, and any other color for the third.—Royal Tourist Car Co.

FIG. 3—ONE OF THE CARDS

1 Heat Treat.	5 Engine Lathe	6004
2 Gridley Aut.	6 Drill Press	
3 Drill Press	7 Grind	
4 Water Test	8 Inspection	

RECHARGING GAS TANKS

Indianapolis, Ind.—Editor Motor Age—The various companies organized throughout the country within the last 6 months to re-charge Prest-O-Lite and other gas tanks seem to be finding more truth than poetry in the sentiment, "No rose without its thorn." The companies have been inspired by the makers of a charging device. Local capital has been enlisted in many good sized towns to refill Prest-O-Lite tanks, instead of sending them to the Prest-O-Lite Co., on the theory that the profit involved might just as well be kept at home. The makers of the charging outfit are said to give with each machine a guarantee that the user will be protected from litigation. No person who is well informed will imagine that the Prest-O-Lite Co., or any other well-established concern, would allow anyone to come in and walk off with the cash drawer without putting up an argument, especially when the United States courts have very plainly decided that Prest-O-Lite tanks cannot be refilled by anyone except the Prest-O-Lite Co., unless the Prest-O-Lite name plate first is removed from the tank. As a consequence the Prest-O-Lite Co. is preparing to give the home-town re-charging com-

Road Contractors Organize To Test the Law's Validity

Indianapolis, Ind., Nov. 28—About 600 road contractors of the state have organized to test the validity of road contracts now under way in Indiana. Recently the supreme court held that the road laws under which improvements were met through bond issues were invalid. Later it was held that where contracts had been let and begun the bonds would be good in proportion to the amount of work performed. About $2,000,000 worth of road work is now under way in the state. On some of this the contracts have been let and part of the work has been completed, the entire bond issue having been sold. In many instances the work has been started but the complete bond issue has not been sold. The contractors believe that every contract let prior to the date of the court decision should be valid and binding on the counties entering into them. Suit will be brought to test the validity of these contracts and in an effort to get a ruling that the bond issues in such cases are valid. At this time all road work in the state, started under the laws which have been held unconstitutional, has been suspended. Under the laws the successful contractors usually looked after disposing of the bonds. These laws required that the bonds be sold at par, and where this was impossible in many cases property owners made up a purse sufficient to bring the proceeds of the bond issues to par. The contractors call their association the Indiana Public Improvements Association.

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panies a vigorous and widespread treatment of litigation. Suits have been commenced in Cleveland, Milwaukee, St. Louis, Los Angeles and Chicago, and more will follow. Another discouraging point to the various local companies is the frequency of explosions. The man who carries a gas tank on his car runs no risk, but the man who charges it is exposed to considerable danger. It took the Prest-O-Lite Co. a good many years and cost it a small fortune in ruined property and damage suits before it learned how to generate large quantities of acetylene gas and put it in small cylinders, under high pressure, with comparative safety. Considering the fact that the Prest-O-Lite people have an organization extending from ocean to ocean, and employ a small army of acetylene experts, it readily can be understood that small local companies without any particular experience whatever are booked for trouble galore. Within the past 3 months there have been serious explosions at Minneapolis, St. Paul, San Francisco, Utica, N. Y., Lone Tree, Ia., and other places, involving loss of property and in some cases loss of life, which is to be greatly regretted.

We need not tell that the familiar copper cylinder is all that comprises Prest-O-Lite. These cylinders cease to be the genuine Prest-O-Lite when filled by other parties who know nothing of our special methods for refilling our tanks. There are a number of companies forming throughout the United States interesting local capital in an effort to properly exhaust Prest-O-Lite cylinders. In the majority of these cases these companies are using what is known as a high-pressure generator. These are extremely hazardous and liable to explode at any time. A glance throughout the headlines in some of the daily papers, copies of which we have sent to dealers in the United States, shows that there have been a number of horrible accidents resulting from the use of these highly dangerous methods. We have every reason to expect, and former decisions to sustain these expectations, that the several suits started by us will be decided in our favor by the courts of the country.—Prest-O-Lite Co.

Patent Commissioner Is Busy Negotiating Treaties

Washington, D. C., Nov. 27—Edward B. Moore, commissioner of patents, recently returned from a trip abroad, which is likely to result in material benefit to American manufacturers who seek the European market. He went as a special emissary of the state department to negotiate patent treaties that would give American manufacturers the same chance in European countries that European manufacturers have here.

Every nation of Europe except Germany has a provision in its patent laws that a patent or trade mark becomes void unless the article is manufactured in the country granting the patent or trademark, within periods ranging from 2 to 4 years. The United States has no such provision.

"This requirement is a great hardship to the American manufacturer," said Commissioner Moore recently. "In most cases they do not want to duplicate their investment in a foreign country and make their article there, and yet they must do this in order to enjoy the patent rights. I went to Denmark, Norway, Sweden, Russia, Austria, Italy, France, Spain and Belgium, and was received by the proper officials. Before them I explained the position which this country takes in the matter, which is that the same treatment should be accorded our manufacturers as we accord theirs. I was assured in every country that the proposal of the United States would be favorably considered, and I have reason to believe that several satisfactory treaties will be arranged in the near future. Since my visit to Sweden that country has removed the objectionable clause in its patent law."

Mr. Moore said he had visited Great Britain and Germany a year ago, with the result that a satisfactory treaty had been signed with Germany.

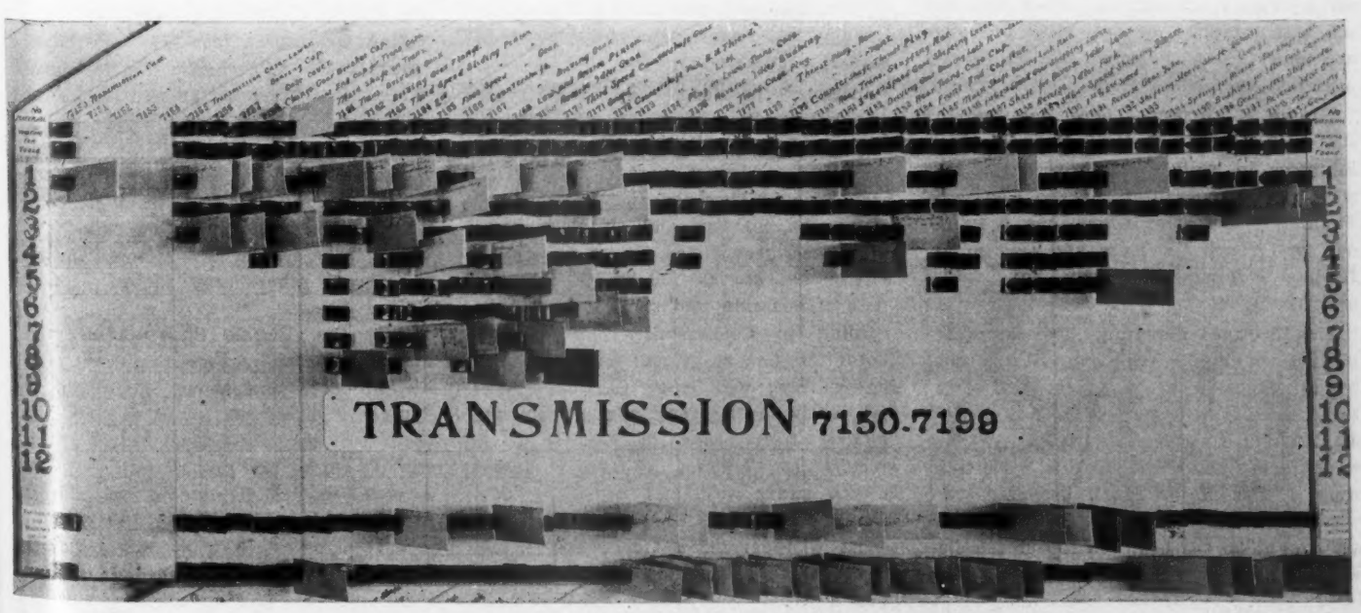


FIG. 2—METHOD USED BY ROYAL TOURIST TO KEEP TRACK OF TRANSMISSION MATERIAL

Among the Makers and Dealers

TWO OF THE NEW BUILDINGS THAT HAVE BEEN ADDED TO THOMAS PLANT AT BUFFALO

Have the Rambler—The Cherry City Automobile Co., of Salem, Ore., have secured the agency for the Rambler.

To Make Transmissions—The Superior Machine Tool Co., of Kokomo, Ind., builder of milling machines, is now, according to Raymond Ruddell, president, preparing to build transmissions for makers of motor cars.

Houk Secures Location—E. E. Houk, who represents the White steamer and the Hupmobile in Nashville, Tenn., has leased half of the building of the B. F. Bell Auto Co., on Broadway, and will have his show room there.

Working 12 Hours a Day—The entire force of employes of the Mitchell Motor Car Co., at Racine, Wis., has been placed on a 12-hour schedule in order to catch up with orders. Several new buildings are now being occupied, and work on others is well under way.

Hipple a Quaker—There has been a shake-up in the Chalmers-Detroit representation in Philadelphia within the past week. Frank Fanning, of the Chalmers-Fanning Co., former agent, has been let out, and Hugh Chalmers and George W. Hipple, a former Chicagoan, have taken over the agency.

Should Guard Elevators—Two motor accidents in big garages in Boston has called attention to the fact that something more than a chain or gate is needed as barriers for elevator wells. A few weeks ago a car backed down an elevator well in the Motor Mart, dropping two stories, and but for the fact that the car caught on the beam on top of the elevator, the driver of the car would have been killed. Last week a similar accident happened at another garage in the Back Bay, when a car backed down the well, dropping one story and injuring the chauffeur.

Hamms Buy Place—Hamm Brothers have purchased the Moe building at Waterford, Wis., and will convert it into a garage and machine shop. An agency line will be announced soon.

Powell Succeeds Bell—W. B. Powell, formerly the Hartford tire representative in Indianapolis, has been appointed to fill the Chicago branch vacancy caused by W. H. Bell becoming manager of the Chicago Rambler branch.

Midland in the Hub—The Henderson-Lowe Co. has been formed in Boston to handle the Midland in the Hub. George H. Lowe, one of the best known dealers in New England, will manage the agency. Headquarters have been secured at 117 Massachusetts avenue.

Cramped for Room—The Crescent City Automobile Co., agent for the Thomas, Chalmers-Detroit and Hudson, and doing one of the biggest garage and taxicab businesses in New Orleans, La., has outgrown its quarters and on December 1 will break ground for a new garage. It will be two stories, 100 by 100 feet, and built of concrete and steel.

Going to Connersville—The Lexington Motor Car Co., at present located in Lexington, Ky., will move to Connersville, Ind., early in the year, where the manufacture of 400 cars for 1910 will take place. The Connersville factory already is well under way, and it will be completely equipped as soon as finished. The report was current 2 weeks ago to the effect that a different arrangement had been made, whereby the company would remain in Lexington. Such is not the case, and the company's previous plans to locate in Connersville are now well matured.

New Garage Opened—The new garage of A. G. Maurer, on Niagara avenue, Sheboygan, Wis., was formally opened last week.

In a Good Location—The Maxwell-Briscoe Motor Vehicle Co., of St. Louis, is now located on Twelfth street, between St. Charles and Olive. This location, in St. Louis, is regarded as advantageous by knowing ones.

Will Handle the Winton—Crockett & Manley, proprietors of the Union Auto Co., of Bellingham, Wash., have taken the Winton agency in Whatcom and Skagit counties. The Union Auto Co. maintains the largest garage in Bellingham.

New Heating System—The new $500,000 plant of the A. O. Smith Co., Milwaukee, Wis., manufacturer of pressed steel frames and parts, will be heated by a new and unique system, invented by Jesse C. Coogan, of Milwaukee. The exhaust from the gas engine will be conducted through the factory into radiators filled with water. The system is now being installed in several other large factories of the United States.

Only One Buffalo Show—After weeks of discussion and reports that there would be two motor car shows in Buffalo this winter, it has been finally decided that there will be only one exhibition, which will be under the joint auspices of the Automobile Trade Association and the Buffalo Automobile Club. According to present plans the show will be held at the Broadway arsenal, the second week in February. In making arrangements for the event G. H. Poppenberg and Charles

Monroe will represent the dealers, and Harry T. Vars and Laurens Enos will represent the club.

Sere Has Rider-Lewis—New Orleans' newest automobile agency is that of the Rider-Lewis car. It is handled by L. Sere.

Boston Bankruptcy Case—The firm of Ferdinand French & Co., of Boston, which has the agency in the Hub for the Herreshoff car, has filed a petition in bankruptcy.

Specializing on Castings—The More-Jones Co., of St. Louis, is busy on a line of brass, bronze and aluminum castings for use in motor cars. It is the claim of the company that all its work will be up to a high standard, due to the use of new brass and selected aluminum.

Moon's New Features—The Moon Motor Car Co., of St. Louis, with a shop full of the latest machine tools, is pushing the work on the new model, which is a 30, with T type cylinders. Attention is also called to the road wheels, which are of special design, with spokes so shaped that they are not only capable of taking the load at the felloe, due to liberal bearing surfaces, but they are fashioned as the Indian's bow, to give at a certain point, the object being to prevent loosening up at the miter.

W. Hildreth Resigns—W. Hildreth, vice-president and manager of the Holsman Automobile Co., of Chicago, has after 7 years of close application to the interests of this pioneer motor buggy concern resigned to enjoy a much-needed rest. His present intentions are to spend several months in travel for the benefit of his health. Mr. Hildreth was one of the organizers of the Holsman company and since that time he has filled the office of vice-president and manager of this concern and has been an enthusiastic motorist, having brought the motor buggy into the contest field by entering it in the big reliability and hill-climbing contests in and around Chicago. Mr. Hildreth is at present a member of the ways and means committee of the Chicago Association of Commerce and was a delegate to the national tariff commission convention held this year at Indianapolis, representing as he did on

FORD'S NEW LONDON BRANCH

this commission the motor car and foreign trade division. A banquet was recently tendered Mr. Hildreth by the Holsman company employes. George E. Sherman, formerly Mr. Hildreth's assistant, has been made advertising manager of the Holsman.

Denver Change—The Brinker-Vreeland Automobile Co., of Denver, has been succeeded by the Vreeland Brothers Automobile Co., of which the members are F. S. Vreeland and B. G. Vreeland. Harold Brinker, the retiring member, has joined the sales force of the Johnston-Fetcher Motor Sales Co. The Vreeland Brothers Automobile Co. will continue to handle the Moon, Matheson and Rauch & Lang.

D. W. Henry a Maker—The Henry Motor Car Co. has been incorporated in Michigan and will manufacture cars at Muskegon, getting its name from D. W. Henry, known in the motoring field through his connection with the Electric Vehicle Co., Ford, and Inter-State. The factory of the company at Muskegon will be 110 by 550. Approximately 1,000 cars will be manufactured before August 1, 1910. The car will accommodate five passengers, has 35 to 40 horsepower and a wheelbase of 116 inches. The officers of the company are: President, W. L. Simonton; vice-president, Charles F. Latimer; treasurer, Charles H. Latimer; secretary, P. H. De Mange; general manager, D. W. Henry.

Succeeds Parham-Goudy—The Anti-Selenite Co., of St. Louis, manufacturer of carbon remover, has been succeeded by the Parham-Goudy Co.

May Go to Kendallville—Kendallville, Ind., is soon to have a motor car factory. This is the announcement given out by Raber-Lang company, which, at the present time, is engaged in the manufacture of cement tile machinery, but expects to enlarge its plant and company by selling stock to the small investor.

Fifth Times Square Branch—The Times Square Automobile Co., of New York, has secured locations in the motor row district of Philadelphia, where will be opened its fifth branch house. This company has distributing depots at New York, Chicago, St. Louis and Kansas City. The new Philadelphia branch will be at 238-240 North Broad street. These new show rooms and repair shops have some 9,000 square feet of floor space.

Prest-O-Lite Starts Suit—A federal action was instituted in Kansas City last week by the Prest-O-Lite Co. and the Commercial Acetylene Co., both of Indianapolis, against E. P. Moriarty and James F. Moriarty, comprising the firm of E. P. Moriarty & Co., and the Kansas City Gas Supply Co., of Rosedale, a suburb of Kansas City. The Prest-O-Lite Co. and the Commercial Acetylene Co. ask for an injunction against the defendants, who are charged with refilling Prest-O-Lite tanks in Kansas City against the express stipulations of the purchase contract.

Washington Changes—The L. P. Dorsett Co. has secured the agency in Washington, D. C., for the Klinekar. This firm also handles the Stoddard-Dayton, Mitchell, Empire and Babcock electric. Improvements doubling the company's salesroom and garage have just been completed. The American Motor Truck Co. has been given the Hart-Kraft agency in Washington. The Thomas & Tolman Co., of Washington, D. C., has given a bill of sale to the John R. Thomas Automobile Co. of all its contracts, lease and chattels

PLANT AT MUSKEGON, MICH., SECURED BY THE NEWLY ORGANIZED HENRY MOTOR CAR CO.

STUDEBAKER GARAGE IN PITTSBURG, LOCATED IN BASEBALL GRAND STAND

at 1828 L street, N. W. The consideration was nominal. The Pullman and Maxwell agencies are involved in the deal.

Increases Output—The Cole Motor Car Co., of Indianapolis, has completed its plans to increase the 1910 output by 300 cars.

Garage for Mishawaka — Mishawaka, Ind., is soon to have an up-to-date garage. John Z. Wilklow, a former well-known liveryman, has decided to build a two-story brick structure on his property adjoining the new Mishawaka hotel.

Portland Changes—Gumpert & McCroskey are now handling the Regal, at 531 Alder street, Portland, Ore. The Willamette Auto and Supply Co., has been recently incorporated in Portland to handle the McIntyre cars. It is composed of George Prosser, George Guther and W. B. Neff. They are temporarily located at 532 Alder street.

Takes Over Another Concern — The Franklin Automobile Co., of Milwaukee, Wis., recently incorporated, has taken over the interests of the Bland-Mueller Auto Co., Fourth and Prairie streets. A tire repair and vulcanizing department has been added to the general repairs department, already one of the largest in the west. The company is agent for the Franklin in Wisconsin.

Lambert Appointees—Recently appointed agents for the sale of Lambert motor cars are as follows: Meils Motor Car Co., Kansas City, state of Kansas and southwest Missouri; Kaufman & Slusher, Denver, Colo., south Wyoming; Hicks & Son, Imperial, Neb., southwestern Nebraska; Perry Fraser, Du Bois, Iowa, six southern counties in Nebraska; Adams & McClusky, Sioux City, Ia., northwestern Iowa, northeastern Nebraska, southeastern part of South Dakota; Lars Gulbradson, Nora Springs, Iowa; Delmar Auto Co., Delmar, Ia.; H. A. McIntire, Mariquota, Ia.; W. T. Peters, Burt, Ia.; J. A. Ryan, St. Joseph, Mo.; McNurlen & Schoenmann, Spring Green, Wis., southwestern Wisconsin.

Binghamton Show Dates—Plans have been made by the Binghamton, N. Y., Automobile Club for its motor car show, to be held at the state armory in that city February 21 to 26, inclusive.

Will Be at Big Shows—The C. A. Shaler Co., Waupun, Wis., maker of the Shaler vulcanizer, reports a flood of orders as the result of the Atlanta show. The capacity of the plant at Waupun is taxed. Exhibits, nevertheless, will be made at all of the larger shows, including the Chicago and Milwaukee expositions, and the production will be increased in anticipation of a big business.

Will Enter the Commercial Field—The United Vehicle Co. has just been formed in Boston by A. L. Waugh, Frederick Wells and J. G. MacDonald. The new firm proposes to go into the commercial vehicle field exclusively on a large scale and will erect a plant in Cambridge with 80,000 square feet, in which to build trucks. The vehicles will be from 20 to 60 horsepower. All three men are well known in Boston business circles. The first year's output has been placed at 150 machines.

Out of Receiver's Hands—The Consolidated Mfg. Co., of Toledo, O., which for some time has been in the hands of a receiver, has been reorganized. A new company has been incorporated by Charles F. Chapman, Frank W. Caughlin, Eugene W. Winkworth, Frank E. Miller and Edgar C. Hampton, with a capital stock of $225,000. It is understood that other interests are back of the project. While in the hands of W. C. Robison, Jr., receiver, under the management of Superintendent W. F. McGuire, the concern has made money in the manufacture of bicycles, motor cycles and small vehicles. Its plant is located on Fernwood avenue, Toledo, and it is the intention to branch out into the motor car business as soon as matters are straightened out.

Has Cole Territory—The Cole-Stratton Co., of New York, is trying to secure an agent in Boston for the Cole, for which it has the eastern territory.

Toledo Firm's Line—The Dosson Carriage Co., of Toledo, well known to the vehicle trade of that vicinity for many years, has closed contracts to handle the Brush runabout, the Patterson and the DeTamble cars for the coming season.

Death of Charles Waugh — Charles Waugh, of Cambridge, Mass., who was identified with the company bearing his name, and which for many years had been in the wagon business, but of late years was making commercial trucks, died last week. He was one of the best known men in the industry in Massachusetts.

First Badger Shipped—The Badger Motor Car Co., of Columbus, Wis., on Thanksgiving day, shipped its first finished product, the four-cylinder, 30-horsepower Badger, to the Premier company, its Chicago distributor. The company expects to be turning out fifteen to twenty cars a week as soon as its new factory is completed.

Pick a Name—The Green Bay Motor Car Co. is the name of the new concern organized by Malchow & Zimmerman, of Oshkosh, Wis., to succeed to the motor car department of the Gottfredson Brothers company, wholesale hardware dealer at Green Bay. The Gottfredson garage has been remodeled at a cost of $5,000 and now has a clear floor space of 65 by 100 feet, on two floors. A new repair department has been built with dimensions of 21 by 44 feet.

New Magneto on Market—The Whelchel Electric Co., of Anderson, Ind., was organized August 20 last to build magnetos, and the product of the company is just appearing on the market. Bert Whelchel, who has been engaged in magneto manufacturing for 7 years, is president. John W. Jones is vice-president. A. S. McCall and John Rickes are secretary and treasurer, respectively. The company has secured a plant at the corner of Third and John streets, in Anderson.

New Chalmers Idea—W. C. Hood, of Detroit, has been made inspection agent for all Chalmers-Detroit cars on the Pacific slope. Mr. Hood will visit the eight or ten large cities, including Spokane, Seattle, Tacoma and Portland, in turn, making each about every 6 or 8 weeks, and it will be his duty to overlook and repair every Chalmers machine in this big territory and keep them in good running order. The inspection system, according to Mr. Hood, will cost the company about $20,000 a year, but it is considered cheaper in the long run on the theory that a satisfied customer is the best advertisement. Jean Bemb, winner of the Detroit trophy

in the Glidden tour, will assist Mr. Hood in his new duties. L. W. Hodgins is now the agent for the Chalmers car in Spokane.

Badger Brass Increases Capital—The Badger Brass Mfg. Co., of Kenosha, Wis., with a branch factory in New York, has increased its capital stock from $50,000 to $200,000.

Ford's London Branch—The new Ford Motor Co. branch established in London, England, is located at 55-59 Shaftsbury avenue, London, and is in charge of P. L. D. Perry. Mr. Perry for some years has been senior partner of the firm of Perry, Thornton & Schreiber, London, which concern has handled Ford cars throughout the United Kingdom.

Enterprising Chain Makers—The Diamond Chain Co., of Indianapolis, with largely increased facilities, is putting out more chains than ever, and has decided to offer aid to every user of sprocket wheels and chains, even to the extent of furnishing properly-cut sprockets. In certain cases it is the experience of the company that sprockets, unless they are properly cut, soon will destroy the chains.

Opens With Haynes—An agency has just been opened in Detroit by E. D. Hutchinson, who, from quarters just secured at 36 John R. street, will handle the Haynes car for Michigan. This is the first representation which this car has secured in Detroit, its advent being paralleled this fall by several similar instances, notably the Stearns, the Reo and the Palmer-Singer, all of which have but recently established local agencies.

Speedwell Ohio Agents—The Speedwell Motor Car Co. has appointed the following agencies in Ohio: Speedwell Motor Car Co., 228 East Sixth street, Cincinnati; Electric Construction and Motor Co., Findlay; Central Motor Co., 26 North Second street, Hamilton; Canton Motor Car Co., 113-25 Fifth street, Canton; S. Siegert & Sons, Coshocton; Park Motor Car Co., 10215 Superior avenue, Cleveland; Kimmel Brothers, 170 North Second street, Columbus; Frank Hilt, Tenth and Madison streets, Toledo.

Kansas City Happenings—Two moves of consequence in Kansas City will be the changes of offices of the Greenelase Motor Car Co., representing the Cadillac and Thomas, and the Franklin Motor Car Co., both moving from East Fifteenth Street garages to new building on South Main street. The new home of the Cadillacs and Thomases is at 3332 to 3334 Main street; the Franklin headquarters will be at 3320 and 3322 Main street. South Main street is Kansas City's newest motor row. It is rumored that the Pierce-Arrow and the Stevens-Duryea will soon be showed on South Main street. A big Velie building is now under construction at Thirty-third and Main streets. The Lake Motor Car Co. has taken the agency of the Stearns in Kansas City. J. W. Bergers, the Halladay agent, who has been ill in an Omaha hospital for several months, will resume his office work next week.

Will Resume Work—The Ewing Automobile Co., of Geneva, O., will soon start operations after an idleness of several months. Since the transfer of the property the proposed plan of moving the plant to Easton, Pa., has been abandoned.

Empire Tire's Quaker Branch—The Philadelphia branch of the Empire Tire Co. has been recently opened at 322 North Broad street, and is managed by E. B. Richardson, who has been connected with the company for a number of years.

Another in Detroit—The Detroit Motor Sales Co., of Detroit, is the latest addition to the ranks of the local retailers. It has established its salesrooms at 473 Woodward avenue and will handle the Page-Detroit and the Keystone cars. Guy B. Cady is the president of the concern.

Elmore Deal Closed—Agreements have been signed and arrangements made for turning over the plant of the Elmore Automobile Co., at Clyde, O., to the General Motor Co. at a consideration said to be around $750,000. The Elmore factory was owned by H. V. Becker and his sons, James and Burton. Recently the partnership was incorporated with a capital stock of $600,000. It is said the plant will remain at Clyde.

New Sterling Agents—The Elkhart Motor Car Co., of Elkhart, Ind., has appointed the following agencies: United Motors Co., Chicago, Ill.; J. F. Lakin, Kansas City, Mo.; Davies & Jung, Los Angeles, Cal.; Central Garage Co., St. Louis, Mo.; Bryan-Black Supply Co., Oklahoma City, Okla.; Williamsport Auto Co., Williamsport, Ind.; Mavity-Sleeper Co., Fowler, Ind.; Boyd Automobile Co., Kansas City, Mo.; Clinton Auto Supply Co., Clinton, Ia.; P. D. Prosser, Kansas City, Mo.; J. H. Edwards Auto Co., Colorado Springs, Colo.; William H. Gerhard, Austin, Tex.; Albert F. Larson, Holdrege, Neb.; Thomas Nolan, Lamont, Okla.; W. R. Ross, Star City, Ind.; Shelbyvile Auto and Garage Co., Shelbyville, Ind.; St. John's Auto Co., St. John, Kans.; Strong Motor Car Co., Des Moines, Ia.; A. I. Baird, Charleston, W. Va.

Secures Store for Rainier—Raymond S. Joo, manager of the Boston branch of the Rainier, has secured permanent headquarters now on Boylston street, in the heart of the motor colony.

Go With Studebaker—Russell M. Cuthbert and F. C. Smithson, who were formerly connected with the Portland, Ore., agency for the Auburn, have severed their affiliations with that make of car in order to take up the Studebaker line.

Flywheels Its Specialty—The Medart Patent Pulley Co., of St. Louis, is specializing on motor car flywheels. The facilities of the company are such that a considerable trade can be accommodated and deliveries are reported prompt.

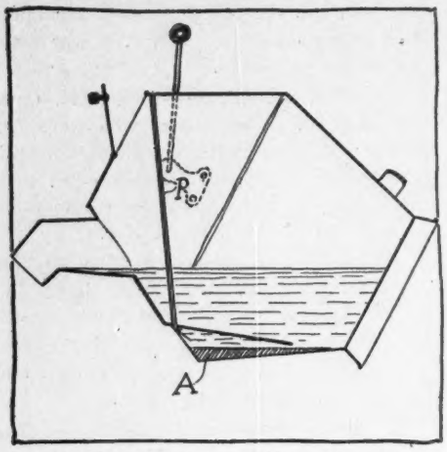
A New Studebaker Agency — The Raleigh Motor Car and Machine Co., of Raleigh, N. C., has opened its new garage and shops at 109 East Morgan street. It carries a complete line of accessories. The officers are: A. W. Goodwin, president; C. L. Woodall, vice-president; L. McA. Goodwin, secretary and treasurer; B. L. Lumpkin, manager.

Has Continental Agency—The Continental Caoutchouc Co., of New York city, has arranged for an agency in Los Angeles, Cal., which will be in charge of the E. A. Featherstone Co., 1018 South Main street, from which point Continental tires and Continental rims will be distributed. The territory to be covered from the Los Angeles office is south Colorado, Arizona and a portion of Nevada.

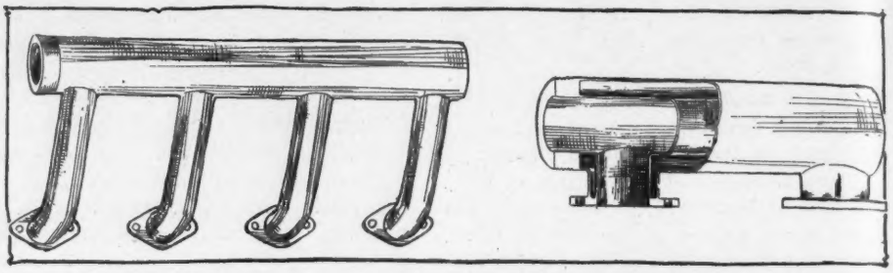
Places Petrel Agencies—W. A. Wright, of the Motor Sales Co., of Minneapolis, placed several Petrel agencies in South Dakota. Work has been started on an addition to the Motor Sales Co.'s garage and it probably will be completed by December 15. More space was found necessary to enable the storage and handling of cars which the concern carries. The addition will be joined to the rear of the present structure.

FAREWELL DINNER GIVEN W. HILDRETH BY HOLSMAN COMPANY

Development Briefs



CAN REMOVES WATER FROM GASOLINE



NATIONAL WELDING AND MFG. CO.'S WATERJACKETED EXHAUST MANIFOLDS

New Rambler Lamp

A distinctive feature has been added to the 1910 Ramblers by Thomas B. Jeffery & Co., in the way of a special design of headlight. As illustrated, the top of the lamp is formed to incorporate in relief the Rambler spare wheel. Readers of Motor Age are aware of the fact that this Rambler spare wheel is regularly equipped on all Rambler cars, the wheel being removed in case of a puncture instead of the tire.

Foy Electric Tail Lamps

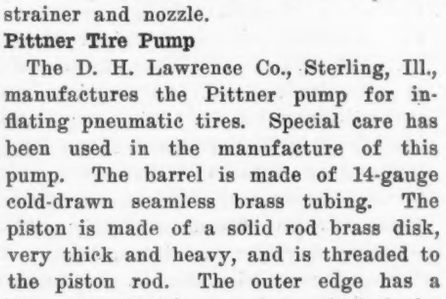
The Jordan Equipment Co., Beverly, Mass., manufactures the Foy electric tail lamp and number-holder for motor cars. This combination is illustrated. Electric current is supplied in either a set of four dry cells or an ordinary ignition battery. The electric filament is a Tungsten suspended between two spring cushion terminals which prevent it from jarring out. Heavy ground glass stands the full length of the under part of the lamp, giving a well-diffused white light over the number, and projecting a bar of white light across the road.

Removes Water from Gasoline

The Pure Gasoline Can Co., Chicago, has produced something new in the way of a gasoline can for transferring fuel from the supply tank or wagon to the tank of the motor car, which separates and retains any water therein, and which is remarkable for its efficiency and implicity. As shown above, this patented device is built into an ordinary 5-gallon spout-pouring can, and works on a natural principle that cannot fail. This illustration is a sectional view of the can, and the features to which it owes its efficiency are the catch basin and its drain-pipe, P. It is a well-known fact that water is much heavier than gasoline, and when water is mixed with it, it quickly settles to the lowermost portion of the vessel containing the gasoline, as designated by the shaded lines, A. The gasoline which flows out through a strainer in the nozzle leaves the nozzle in a perfectly pure state, that is, free from water or dirt, while the water and sediment flow into a receptacle, from which it may be drained through the pipe, P, by simply tipping the can further, after all the gasoline has been poured out. To test the efficiency of this device, Motor Age colored about 3 ounces of water with red ink, then poured it into the can, containing 4 gallons of gasoline. The entire contents of the can proper was then poured into a pail and the contents of the receptacle into a glass jar. Not a globule of the colored water was present in the pail of gasoline, which came through the strainer and nozzle.

Pittner Tire Pump

The D. H. Lawrence Co., Sterling, Ill., manufactures the Pittner pump for inflating pneumatic tires. Special care has been used in the manufacture of this pump. The barrel is made of 14-gauge cold-drawn seamless brass tubing. The piston is made of a solid rod brass disk, very thick and heavy, and is threaded to the piston rod. The outer edge has a circumferential groove, into which is inserted a thick leather strip, which does not fill the entire groove, but leaves an annular space between it and the piston. The circumferential length of the leather is such that it has to be slightly compressed in order to be inserted in the groove. This insures it forming a tight fit within the cylinder. In the piston are four air passages, which communicate between the annular space behind the leather packing ring and the pressure side of the piston, so that, irrespective of the pressure in the pump cylinder, there is the same pressure pressing out against the packing of the piston. The cap for the cylinder head is machined out of a solid brass rod and the bushing for the piston rod is of hardened steel and threads into the cap.



THE NEW RAMBLER LAMP

FOY ELECTRIC TAIL LAMP

Waterjacketed Manifold

The National Welding and Mfg. Co., Buffalo, N. Y., manufactures different types of exhaust manifolds for gasoline engines. A feature of one of these is that it is waterjacketed throughout, as illustrated above. These manifolds are welded steel and are made either with single walls or waterjacketed walls, as illustrated. In the waterjacketed one illustrated it will be noted that the water not only circulates around the complete horizontal portion, but around the short individual pipes uniting with the separate cylinders.

Valve Grinding Compound

The Victor Auto Supply Co., New York, is marketing the Vesco grinding compound for use in connection with valve-grinding. This compound is intended to take the place of emery, the abrasion in it is an electro-chemical product. It is put up in collapsible tubes, both coarse and fine. It is claimed to produce a smooth, even surface.